

1	IN THE UNITED STATES DISTRICT COURT	
2	MIDDLE DISTRICT OF NORTH CAROLINA	
3	COMMON CAUSE, et al.,) Greensboro, North Carolina
4) October 17, 2017
5	Plaintiffs,)
6	v.) Case No. 1:16CV1026
7)
8	ROBERT A. RUCHO, in his)
9	official capacity as Chairman)
10	of the North Carolina Senate)
11	Redistricting Committee for)
12	the 2016 Extra Session and)
13	Co-Chairman of the Joint Select)
14	Committee on Congressional)
15	Redistricting, et al.,)
16)
17	Defendants.) Bench Trial
18)
19	LEAGUE OF WOMEN VOTERS OF) Volume II of IV
20	NORTH CAROLINA, WILLIAM)
21	COLLINS, ELLIOTT FELDMAN,)
22	CAROL FAULKNER FOX,)
23	ANNETTE LOVE, MARIA PALMER,)
24	GUNTHER PECK, ERSILA PHELPS,)
25	JOHN QUINN, III, AARON SARVER,)
	JANIE SMITH SUMPTER,)
	ELIZABETH TORRES EVANS, and)
	WILLIS WILLIAMS,)
)
	Plaintiffs,)
)
	v.) Case No. 1:16CV1164
)
	ROBERT A. RUCHO, in his)
	official capacity as Chairman)
	of the North Carolina Senate)
	Redistricting Committee for)
	the 2016 Extra Session and)
	Co-Chairman of the 2016 Joint)
	Select Committee on)
	Congressional Redistricting,)
)
	DAVID R. LEWIS, in his)
	official capacity as Chairman)
	of the North Carolina House of)
	Representatives Redistricting)
	Committee for the 2016 Extra)
	Session and Co-Chairman of the)

1 2016 Joint Select Committee on
 Congressional Redistricting,)
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 TIMOTHY K. MOORE, in his)
 3 official capacity as Speaker)
 of the North Carolina House of)
 4 Representatives,)
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 5 PHILIP E. BERGER, in his)
 official capacity as President)
 6 Pro Tempore of the North)
 Carolina Senate,)
 7)
 A. GRANT WHITNEY, JR., in his)
 8 official capacity as Chairman)
 and Acting on Behalf of the)
 9 North Carolina State Board of)
 Elections,)
 10)
 THE NORTH CAROLINA STATE BOARD)
 11 OF ELECTIONS, and)
 THE STATE OF NORTH CAROLINA,)
 12)
 Defendants.)
 13)

14 PROCEEDINGS HEARD BEFORE:

15 **WILLIAM L. OSTEEN, JR.,**
 16 CHIEF U.S. DISTRICT JUDGE FOR THE MIDDLE DISTRICT OF N.C.

17 **W. EARL BRITT**
 18 SENIOR U.S. DISTRICT JUDGE FOR THE EASTERN DISTRICT OF N.C.

19 **JAMES A. WYNN, JR.**
 CIRCUIT JUDGE OF THE U.S. COURT OF APPEALS FOR THE 4TH CIRCUIT

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P R O C E E D I N G S

(At 9:07 a.m., proceedings commenced.)

JUDGE OSTEN: All right. One small housekeeping matter before we get started, and, that is, those of you who have tried a case in my courtroom know that, generally speaking, we do the "all rise" at the beginning of the day and the end of the day, and then the rest of it's just remain seated and come to order when the Court enters the courtroom; but we had such a big crowd here yesterday, that it was a little sluggish getting started, so we're going back to the traditional "all rise" every time the judges enter the courtroom to kind of get everybody's attention a little quicker than we were able to do yesterday.

One word of caution: I'm not going to call anyone out, but do make sure your phones are turned off today. If anybody is smiling and feels guilty, then you all can conclude what you want to from that.

All right. Dr. Chen, you're still in the courtroom. You are still under oath. You can come forward, take the witness stand, and, Mr. Strach, you can resume your cross-examination.

CROSS-EXAMINATION, CONTINUED

BY MR. STRACH:

Q Good morning, Dr. Chen.

A Good morning, sir.

1 Q Dr. Chen, were you in the courtroom when Dr. Mattingly
2 gave his expert testimony?

3 A I was in the room for part of it, sir.

4 Q Have you read Dr. Mattingly's report?

5 A I have not in any detail, sir.

6 Q Do you recall that he did some computer-simulated
7 redistricting plans much like you did?

8 A I wouldn't characterize it that way, sir. I do recognize,
9 from having sat in here for part of his testimony yesterday,
10 that he conducted a version of computer-simulation algorithms.

11 Q Can you tell me how his version differed from whatever you
12 did?

13 A I can't speak for Dr. Mattingly's work, and you'll have to
14 ask him about that, but I can tell you and help you to recall
15 the details of my work, if you'd like. So would you like me to
16 start there?

17 Q I'm trying to just understand if there's a difference
18 between the way you ran your computer simulations to get your
19 redistricting plans versus the way he did, and it's okay if you
20 don't know, but I'm just trying to understand if you know if
21 there's any difference.

22 A Yeah, I don't want to run the risk of mischaracterizing
23 Dr. Mattingly's work because there are several features of it
24 that I have not read in detail, his actual expert report, but I
25 would be happy to highlight some of the technical features of

1 my -- of my expert report that I think --

2 JUDGE OSTEEEN: Dr. Chen, the question simply is: Can
3 you tell us what the difference is between what you did and
4 what Dr. Mattingly did?

5 THE WITNESS: Okay. Thank you, Your Honor. I will
6 do that.

7 JUDGE OSTEEEN: Just answer that question yes or no.

8 THE WITNESS: Okay. I think the answer is that, no,
9 I really can't give you a particularly accurate recounting of
10 that.

11 BY MR. STRACH:

12 Q All right. Thank you.

13 Dr. Chen, when we broke yesterday -- well, and just
14 to set the stage with this, as you may recall from listening to
15 Dr. Mattingly, he had upwards of 24,000 simulated redistricting
16 plans in his report, and you had three sets of 1,000, is that
17 correct?

18 A That's correct about my report, yes, sir.

19 Q Does it make a difference in your mind if he had 24,000
20 and you had a total of only 3,000?

21 A Does it make a difference in what terms, sir?

22 Q Does it affect the statistical validity of either your
23 work or his work given the large difference in the number of
24 simulated plans?

25 A It does not affect the statistical validity of my work,

1 and that's all I can speak to, and I think we had talked
2 briefly about that yesterday.

3 Q All right. And I think you had mentioned when we broke
4 that you had done some work in the past where you had as few as
5 25 simulated redistricting plans. Do you recall that?

6 A Yes, sir, I mentioned that yesterday.

7 Q Can you describe what that work was?

8 A That was a draft paper that I did quite a few years ago, I
9 believe as early as 2009 or 2010, and I was at that time just
10 studying redistricting plans and applying the
11 computer-simulation redistricting algorithm for the state of
12 Florida for various Florida congressional and legislative
13 districts; and I found back then having as few as 25 simulated
14 plans was enough to make characterizations about the
15 distribution of those plans and to draw conclusions about those
16 plans. That's what I was referring to yesterday.

17 Q All right. Thank you. Did you -- you said that was some
18 work in 2009. Did that result in any -- did you make a report
19 using 25 plans to any court in Florida?

20 A That -- I think you're referring to an expert report that
21 I later authored some years later in *Romo v. Detzner*, and I
22 did. That was not the paper that I was just now talking about,
23 but later on, I did write a separate report in *Romo v. Detzner*.

24 Q Did that report, the one you just referred to, include an
25 analysis limited to only 25 plans?

1 A I can't remember exactly what I did in *Romo v. Detzner*.
2 Certainly there, I would have done something more like 1,000 or
3 so plans, something comparable to what I did in my expert -- a
4 number comparable to what I produced for my expert report here
5 today.

6 Q Okay. Have you ever submitted an analysis to a court that
7 used as few as 25 simulated districting plans?

8 A For an expert report, I don't think so, no. I was just
9 talking about a paper I wrote back in 2009 or 2010.

10 Q Did you have that paper published?

11 A A later version of that paper was eventually published
12 after lots of various revisions of different sorts, but a
13 couple years later or several years later, it was eventually
14 published, yes, sir.

15 MR. STRACH: Let's put up Exhibit 5038. Your Honor,
16 I assume your rule is still in effect?

17 BY MR. STRACH:

18 Q Dr. Chen, this exhibit relates to something we talked
19 about yesterday. I think we agreed yesterday that when you
20 added up all of the redistricting plans in your 3,000 -- your
21 set of 3,000, you had a 40 percent BVAP district or higher. It
22 came to about 262 plans. Do you recall that?

23 A Yes, sir, that sounds right.

24 Q Okay. And this exhibit is simply a list of each one of
25 those districts and which district it was that had a 40 percent

1 BVAP. I know you didn't prepare this document. Do you have
2 any reason to dispute its accuracy?

3 A I'll accept your characterization of this document.

4 Q All right. So 200 out of 3,000 -- let me ask you a
5 question real quick about the 3,000. The 3,000 plans that you
6 have there are three sets of 1,000 plans, correct?

7 A Correct, sir.

8 Q Have you physically looked at each one of those 3,000
9 plans?

10 A I didn't actually print out a map of each one and look at
11 each one individually. I have done my standard process of
12 analyzing them by computer. So, certainly, I have inspected by
13 computer all 3,000 of them in my normal ways.

14 Q All right. So are you able to testify today that every
15 single one of those 3,000 plans is different from all the other
16 plans, that they are 3,000 unique plans?

17 A Yes, that's certainly -- I mean, that's certainly
18 something that I would normally check when I analyze them by
19 computer. Again, I didn't visually look at each one of those
20 3,000, but I analyzed them by computer along the things like
21 what you're describing.

22 Q All right. We're going to look at a document that's been
23 marked as Exhibit 5039.

24 JUDGE OSTEEEN: All right. For purposes of the
25 record, let me get something straight here. I don't know how

1 we're proceeding, but, obviously, the Defendants can't
2 introduce evidence during the Plaintiffs' case, but they can
3 mark exhibits and have them identified for purposes of the
4 record and then move introduction later. So usually what I do
5 is if the Defendants' going to be presenting exhibits to a
6 witness, they get identified by number and by the witness; and
7 at that point, if there's going to be an objection, I would
8 expect something to be articulated stating that there is some
9 objection to that particular exhibit.

10 So this morning, as I see it, the first exhibit that
11 came in has got a number on my copy of Exhibit 5038, which has
12 been identified as -- by the witness as something that appears
13 to be a summary of various simulations as testified to
14 yesterday.

15 So backing up, is there any objection to this chart
16 at this point?

17 MR. THORPE: Your Honor, we have no objection to
18 either of -- introducing either of those exhibits.

19 MS. RIGGS: The League has no objection.

20 JUDGE OSTEEEN: Okay. So we got Exhibit 5038. It
21 hasn't been introduced, but it's identified as a summary. So
22 when you're presenting an exhibit, if you'll give us a number
23 so the record remains clear as to what's being handed up, and
24 then just know that when an objection -- I mean, an exhibit is
25 identified, whether it's going to be introduced now or later,

1 that's when at least I anticipate any objection will be
2 forthcoming. All right.

3 MR. STRACH: Thank you, Your Honor. And so for the
4 record, what I've just handed the witness has been marked for
5 identification purposes as Defendants' Exhibit 5039.

6 BY MR. STRACH:

7 Q Dr. Chen, I'll represent to you that this is a chart
8 simply using your data demonstrating -- or listing all of the
9 plans in your three simulations that split a minimum of 11
10 counties with 100,000 population or greater.

11 As we talked about yesterday, do you have any reason
12 to dispute that these are, in fact, the 57 plans that split
13 11 -- at least 11 counties with 100,000 population or greater?

14 A Okay. So you're now talking about this exhibit labeled
15 "5039"?

16 Q Yes, sir.

17 A Okay. Yeah, I believe I recall discussing that yesterday,
18 and, yesterday, I accepted your characterization of this
19 document that way.

20 Q Right. And to remind the Court, this is when we were
21 talking about splitting big counties versus smaller counties.
22 Do you recall that discussion from yesterday?

23 A I recall that. I recall that is what you told me about
24 how you produced this document.

25 Q All right. And would it be fair to characterize a county

1 with at least 100,000 people in it as a big county, a large
2 county?

3 A I really -- I mean, I accept your characterization that
4 way. It's not really anything I studied.

5 Q All right. Thank you.

6 MR. STRACH: Your Honor, I'm going to hand the
7 witness what's been marked for identification purposes as
8 Defendants' Exhibit 5037.

9 BY MR. STRACH:

10 Q Dr. Chen, this is a chart containing all of the plans in
11 your three simulation runs that both contain at least one
12 40 percent BVAP district and split a minimum of 11 counties --
13 11 big counties, as I've characterized it, and that came up
14 with six plans.

15 Do you have any reason to dispute the accuracy of
16 this based on your data?

17 A I accept that that's how you produced this document.

18 Q All right. So would you ever conduct any statistical
19 analysis using simulated maps if it were limited to only six
20 simulated maps?

21 A Well, I've never done so. I'm not going to say that it is
22 impossible to do so, but it certainly wouldn't be my normal
23 research practice to do so, especially with the peculiar unique
24 combination of constraints that I think you were just listing
25 out here.

1 Q Would it be fair to say that running the analysis that you
2 ran using only six simulated maps -- if you were limited to six
3 simulated maps, that that would call into doubt the statistical
4 significance of any results?

5 A No. Before you make any judgments about statistical
6 doubt, you've got to conduct statistical significance testing.
7 Again, as I said, I wouldn't normally do so, but I certainly
8 wouldn't have produced plans with the very specific unique
9 combination of features that I think you're listing out here.

10 Q And you certainly wouldn't have limited yourself to six
11 simulated maps for purposes of your analysis, would you?

12 A Well, as I said in my report I designed it to go to 1,000.

13 Q Right.

14 MR. STRACH: Thank you, Your Honor. That's all I
15 have for now. I understand the witness will be back later.

16 JUDGE OSTEN: All right. Redirect?

17 MR. THORPE: Thank you, Your Honor.

18 REDIRECT EXAMINATION

19 BY MR. THORPE:

20 Q Dr. Chen, good morning.

21 A Good morning, sir.

22 Q Do you recall yesterday an exhibit showing you Chen
23 Simulation Set One, Plan One?

24 A Yes, sir.

25 Q And you have that in front of you?

1 A Yes, sir, I do.

2 Q You did not create this document, correct?

3 A No, sir, not at all.

4 Q But your understanding is that this reflects the visual
5 display of the first set of simulations and the first plan
6 generated, is that correct?

7 A That's how Mr. Strach represented it to me, and I think I
8 accepted that characterization.

9 Q And what does this visual display tell us about the
10 frequency of any of the features appearing in this map,
11 appearing across the range of the thousand simulations that you
12 conducted in Set One?

13 A Oh, virtually nothing at all. This is one plan out of
14 1,000, 1,000 completely different independent districting maps.
15 So this really just tells us 1/1,000th of that total. That's
16 it, no more, no less.

17 Q Is there any way of determining from this single map the
18 frequency with which what were described yesterday as double
19 traversals occur?

20 A No, sir, not at all. It doesn't tell us anything at all
21 about the frequency. It tells us about one map out of 1,000.

22 Q Is there any way to determine from this map the frequency
23 with which a single district exists solely in Mecklenburg
24 County?

25 A No, sir, not at all. I mean, we can see that it occurs

1 in -- you know, it might occur in one plan, or it might not
2 occur in one plan, but this is just one plan out of 1,000
3 independent maps.

4 Q And this map could be created by the Defendants based on
5 the data that was produced in combination with your expert
6 report, is that correct?

7 A It could've been. I turned over all of my data regarding
8 all 1,000 maps. I really can't say exactly how they picked out
9 this particular map.

10 Q You constructed your maps following what you described
11 yesterday as the nonpartisan portions of the Adopted Criteria,
12 is that correct?

13 A Yes, sir.

14 Q And so for that purpose, you used the text of the Adopted
15 Criteria as adopted by the legislature in 2016?

16 A Yes, sir, exactly.

17 Q So you did not look at other aspects of, for example,
18 legislative history to determine whether there may be criteria
19 that were not mentioned in the Adopted Criteria, is that
20 correct?

21 A That is correct. I just read the words on the text of the
22 Adopted Criteria.

23 Q And so you did not evaluate whether amendments, for
24 example, to the Adopted Criteria that were rejected by the
25 Joint Committee had any effect on the partisanship or the

1 predominance of partisanship of any plan?

2 A Absolutely not. I didn't have access to those sorts of
3 amendments.

4 Q And in determining the predominance of partisanship over
5 the plan, you did not evaluate statements of any members of the
6 legislature regarding whether it was possible to draw 11
7 Republican districts, did you?

8 A No, sir, I didn't have access to any such statements.

9 Q And you didn't evaluate any statements by members of the
10 legislature that this was to be a political gerrymander, did
11 you?

12 A No, sir, I did not have access to any such statements.

13 Q And so your conclusion that partisanship predominated over
14 the other criteria in the Adopted Criteria is independent of
15 any evaluation of such statements?

16 A Yes, sir, absolutely.

17 Q In constructing your maps, did you -- you instructed the
18 computer to create 1,000 simulations for each set of your
19 simulations, is that correct?

20 A Yes, sir.

21 Q And each one of those simulations imposed a slightly
22 different set of constraints on those maps?

23 A Yes, sir.

24 Q Did you at any point instruct the computer to generate a
25 thousand maps that had a black voting-age population by

1 district for at least one district of greater than 40 percent?

2 A No, sir. The Adopted Criteria told me to ignore race, and
3 so I ignored race at all times in writing my expert reports and
4 in constructing those simulations.

5 Q Did you at any point instruct the computer to create a
6 thousand simulations that split a minimum of 11 counties of
7 100,000 population or greater?

8 A No, sir. The Adopted Criteria did not tell me to pay
9 attention to that.

10 Q And so by reference to these various charts that show maps
11 with those features, that reflects within the population of
12 3,000 maps how many happen to contain those features, is that
13 correct?

14 A That's correct.

15 Q But, theoretically, and understanding that you've already
16 answered why you didn't do so, you could have created
17 additional sets of simulations that modeled the unique features
18 that are isolated here, is that correct?

19 A Oh, yes, theoretically, very much I could have done so.

20 Q And so it's difficult to determine in the absence of that
21 instruction the statistical significance of the numbers in the
22 exhibits that we've just reviewed?

23 A That's correct, sir.

24 MR. THORPE: Thank you. That's all I have.

25 MR. STRACH: Nothing further at this time, Your

1 Honor.

2 JUDGE OSTEEEN: I've got to ask one question. I got
3 confused yesterday. My apologies, maybe a couple questions.

4 Dr. Chen, on compactness, the instructions originally
5 said that "The Committee shall make reasonable efforts to
6 construct districts in the 2016 Contingent Plan that improved
7 the compactness of the current districts and keep more counties
8 and VTDs whole as compared to the current enacted plan."

9 As I understood your testimony yesterday, you never
10 looked at the 2011 Plan, is that correct?

11 THE WITNESS: That is correct, sir.

12 JUDGE OSTEEEN: So in setting up your program to
13 program compactness, what exactly did you do?

14 THE WITNESS: I tried to draw the districts to be as
15 geographically as compact as possible after, of course,
16 following the other nonpartisan constraints on the Adopted
17 Criteria.

18 JUDGE OSTEEEN: So there wasn't necessarily a
19 percentage on compactness; it's just you program it to say
20 maximize compactness within all five parameters?

21 THE WITNESS: Yeah, after -- that's correct, Your
22 Honor, after satisfying the other criteria to make sure that
23 the districts were as compact as possible, and I certainly did
24 not explicitly analyze the previous plan in place -- in place
25 prior to 2016, but, certainly, it wasn't my -- it certainly was

1 not my understanding that it would be, say, acceptable just to
2 do better than the 12th District was in -- on a compactness
3 measure. When I see that districts are supposed to be compact,
4 I interpret that to mean that we're trying to draw compact
5 districts across the entire plan, not just to say do better
6 than the 12th District was in the previous plan.

7 JUDGE OSTEEEN: So, ultimately, whatever plan you ran
8 was simply to maximize the compactness factor as opposed to
9 simply making it better than the 2011 Plan, is that a fair
10 conclusion?

11 THE WITNESS: Your Honor, I just -- I just wouldn't
12 characterize it as maximizing compactness because there are so
13 many other constraints.

14 JUDGE OSTEEEN: This is where I got confused. You
15 have several factors, and you're not putting -- you're not
16 making compactness predominant, is that correct?

17 THE WITNESS: Yes, sir, Your Honor, that's absolutely
18 correct.

19 JUDGE OSTEEEN: And I'm not using maximize to mean
20 make compactness predominating over any other factor. I'm
21 simply -- we've got an instruction here that says improve it
22 over the 2011 Plan, generally speaking, and so I'm trying to
23 figure out how your algorithm was programmed to accomplish that
24 result. You don't know, as I understand it, what the
25 compactness was of the 2011 districts overall or individual,

1 right?

2 THE WITNESS: Yes, Your Honor.

3 JUDGE OSTEEEN: So somehow you programmed this
4 computer to do something on compactness, but I'm not exactly --
5 essentially it's to -- maybe we're using maximize the same way.
6 It's to make them as compact as possible, correct?

7 THE WITNESS: That's correct, Your Honor, make it --

8 JUDGE OSTEEEN: Is that in relation to the "one
9 person, one vote," so I'm going to have all the districts be as
10 equal as possible on population, and once I've calculated that
11 number, then I'm going to make them all as compact as possible?

12 THE WITNESS: That's basically right, Your Honor. I
13 mean, except -- as I was just saying, obviously equal
14 population is inviable. You cannot violate equal population
15 even if doing so would enhance compactness. The county-splits
16 requirement is inviable. You cannot split an additional county
17 even if doing so would make for a prettier, more compact
18 district.

19 So there are all these things that constrain what we
20 can do in terms of compactness; but after having satisfied the
21 other nonpartisan portions of the Adopted Criteria, then the
22 computer is, in fact, trying to draw really compact districts.
23 So it's constrained in many ways, but compactness is very
24 clearly a requirement of the Adopted Criteria.

25 JUDGE OSTEEEN: Okay. Then in terms of just this

1 algorithm that you are running, the inviable factor is the
2 equal population?

3 THE WITNESS: Yes, Your Honor.

4 JUDGE OSTEEEN: That's in all 3,000 maps?

5 THE WITNESS: Absolutely, Your Honor.

6 JUDGE OSTEEEN: Contiguity, is that an inviable
7 principle?

8 THE WITNESS: Yes, Your Honor.

9 JUDGE OSTEEEN: All right. And what else shall we say
10 would be inviable besides those two?

11 THE WITNESS: Your Honor, there are two others. So
12 the Adopted Criteria tell us that except for equal population
13 considerations, you cannot be splitting VTDs except to achieve
14 equal population. Same goes for counties. The Adopted
15 Criteria tell us that counties can be split for reasons of
16 equal population and some political considerations, which I
17 ignored in Simulation Set No. 1, but those two are inviable,
18 subject, obviously, to the equal population constraints.

19 JUDGE OSTEEEN: So once those rules are more or less
20 set in the algorithm, those calculations are made by the
21 algorithm, and then, ultimately, we get to compactness. So
22 within those rules, we want the districts as compact as
23 possible?

24 THE WITNESS: Yes, Your Honor. After having paid
25 attention to those other four factors first, then we can pay

1 attention to compactness.

2 JUDGE OSTEEEN: In terms of making compactness better
3 or worse than the 2011 maps, you just -- you assumed, because
4 your algorithm had made the districts as compact as possible,
5 that that would then meet these factors?

6 THE WITNESS: That's -- I think that's an accurate
7 characterization, Your Honor. I mean, I would add that --
8 obviously, as a political scientist, I'm aware of the general
9 shape of the previous congressional maps and the controversy
10 that have arisen through those maps. So I'm aware that there
11 were some rather noncompact districts in the previous plan;
12 but, again, as I said, I did not explicitly analyze to make
13 sure. It was pretty clear just from visually looking at it
14 that the simulated maps that were being created were certainly
15 going to improve the compactness relative --

16 JUDGE OSTEEEN: Based on just a visual review?

17 THE WITNESS: That was pretty clear. Obviously, as I
18 said, I didn't do a computational calculation of the Reock
19 score of every district of the 2011 Plan, but, visually, I
20 could see what was going on.

21 JUDGE OSTEEEN: All right. Anything in response to
22 that?

23 MR. THORPE: No, Your Honor, thank you.

24 JUDGE OSTEEEN: Did you all have any questions?

25 JUDGE WYNN: I just have a couple of technical

1 questions, Dr. Chen. I'm over here. We use a lot of terms,
2 and in 2017, they become commonplace, but I want to make sure
3 we are speaking about the same thing. How do you define an
4 algorithm?

5 THE WITNESS: How do I define an algorithm, Your
6 Honor?

7 JUDGE WYNN: Yes.

8 THE WITNESS: An algorithm, in the way that I use it
9 in my report, is a set of rules that I build into a computer
10 program. It's literally a computer program. So it's a set of
11 instructions. I turned over all these instructions, all the
12 computer code. The algorithm is a set of rules that I build
13 into those computer instructions that tell the computer when
14 you're building districts, here's what you pay attention to
15 first, here's what you pay attention to second, and so on.

16 JUDGE WYNN: And where did you derive this set of
17 rules here?

18 THE WITNESS: I derived the set of rules by reading
19 the Adopted Criteria.

20 JUDGE WYNN: And that was the basis upon which this
21 algorithm was formed?

22 THE WITNESS: Yes, Your Honor. What I was trying to
23 do, in forming this algorithm, was to hold several
24 redistricting factors constant that I read from the Adopted
25 Criteria and to hold them constant by incorporating them into

1 that algorithm.

2 JUDGE WYNN: Now, to understand how this type of
3 research is used, is it used in other areas other than in
4 redistricting for certain purposes? And I know that's a
5 general question, but I'm trying to understand. This is not
6 unique or is this unique, the method that you're using for
7 redistricting, from some other areas?

8 THE WITNESS: You know, with the specificity that I,
9 for example, wrote this algorithm here designed to follow the
10 Adopted Criteria, obviously nobody else in the world outside
11 North Carolina does it in quite such specific detail, but it is
12 used in many commercial applications as well as in other
13 academic applications.

14 JUDGE WYNN: Such as?

15 THE WITNESS: Well, just to give a random example:
16 When FedEx wants to decide what kind of delivery zones that
17 they have, they have to set up zones to figure out which
18 drivers are going to go where, how to create maps that optimize
19 their driving time to make their deliveries faster, to minimize
20 the use of their driver resources, things like that. You're
21 basically producing zone maps or delivery maps, and so you can
22 kind of see the parallels between that and the sort of thing
23 that we get into with redistricting. So that's just a random
24 example.

25 JUDGE WYNN: All right. Thank you.

1 JUDGE OSTEEEN: Anything in response to that?

2 MR. THORPE: Thank you, Your Honor, no.

3 JUDGE OSTEEEN: Mr. Strach?

4 MR. STRACH: No, Your Honor.

5 JUDGE OSTEEEN: All right. You may step down,
6 Dr. Chen.

7 (At 9:39 a.m., witness excused.)

8 JUDGE OSTEEEN: Mr. Speas, you disappeared a little
9 bit, but not too far. Does that complete the Common Cause
10 case, or what's going on?

11 MR. SPEAS: That completes the expert testimony from
12 the Common Cause Plaintiffs. Those are our two experts.

13 JUDGE OSTEEEN: Okay. Do you anticipate any further
14 testimony -- I mean, presenting evidence in the case in chief
15 during the trial, or will the rest of it be --

16 MR. SPEAS: I do not.

17 JUDGE OSTEEEN: Okay. Thank you. All right.
18 Mr. Earls, you may proceed.

19 MS. EARLS: Thank you, Your Honors. If I may, just a
20 word of context. As you know from the opening statements, the
21 League of Women Voters' claim is very distinct from that of
22 Common Cause. We intended to present first our evidence
23 relating to the intent prong of the standard we're proposing,
24 and with the next witness, we are moving to the discriminatory
25 effect prong of the standard that the League of Women Voters is

1 proposing.

2 JUDGE OSTEEEN: You may call your next witness.

3 MS. EARLS: Thank you, Your Honor. The League of
4 Women Voters call Dr. Simon Jackman.

5 Your Honors, at this time I would like to move to
6 admit Exhibits 4002, which is the amended report of Dr. Simon
7 Jackman, 4003, which is the rebuttal report of Dr. Simon
8 Jackman, and 4004, which is Dr. Jackman's CV.

9 JUDGE OSTEEEN: Any objection to those?

10 MR. STRACH: No, Your Honor.

11 JUDGE OSTEEEN: Okay.

12 MS. EARLS: And if I may, Your Honor, I have copies
13 to provide to the Court and a witness --

14 JUDGE OSTEEEN: I guess we should keep Dr. Chen's
15 report handy. We'll be coming back to that a little later.

16 MS. EARLS: The clerk had previously asked the
17 Plaintiffs to provide a notebook of expert reports, and so
18 that's what I'm handing up now, which includes the three
19 exhibits that have just been admitted.

20 JUDGE OSTEEEN: Okay. But with respect to Dr. Chen,
21 at some point he'll be recalled, so we need to keep his report
22 handy also?

23 MS. EARLS: Yes, but that will also be in the
24 notebook I'm about to hand to you.

25 JUDGE OSTEEEN: Oh, okay.

1 SIMON JACKMAN,

2 PLAINTIFF'S WITNESS, SWORN AT 9:43 a.m.

3 DIRECT EXAMINATION

4 BY MS. EARLS:

5 Q Would you state your name for the record, please.

6 A My name is Simon Jackman.

7 Q And how are you employed?

8 A I'm a professor of political science and the chief
9 executive officer of the United States Study Center at the
10 University of Sydney.

11 Q And what is the United States Study Center?

12 A The United States Study Center is a research institute, a
13 think tank, if you will, dedicated to the study of the United
14 States and to advancing Australian's understanding of the
15 United States.

16 Q And what do you do in these roles?

17 A It's a mix of things. I research a lot of public outreach
18 and teaching.

19 Q And how long have you had this position?

20 A Eighteen months.

21 Q Prior to that, for 19 years, you were a professor at
22 Stanford University?

23 A That's correct.

24 Q And in what departments?

25 A In the departments of political science and statistics.

1 Q And during that period, you also had visiting
2 professorships at the United States Study Center?

3 A That's correct.

4 Q And early on in your career, you were also a professor at
5 the University of Chicago?

6 A That's correct.

7 Q So you've essentially been in the United States for most
8 of your professional career?

9 A Yes, all but the last 18 months, yeah.

10 Q Now, what is your educational background?

11 A I was an undergraduate back in Australia. I came to the
12 United States. My Ph.D, which I obtained from the University
13 of Rochester in Rochester, New York. I spent three years
14 during that time at Princeton as I was completing my doctorate.

15 Q And what are your areas of specialization?

16 A American political institutions, elections and election
17 forecasting, and the application of statistical methods in
18 political science settings.

19 Q What significant professional leadership roles have you
20 had?

21 A I've been the director of the -- or the principal
22 investigator of the American National Election Studies, the
23 largest, most authoritative, longest-running, survey-based
24 study of the American electorate. I've been the president of
25 the Society for Political Methodology. That is the group of

1 political scientists with -- dedicated to the use of
2 statistical methods in political science. Those are the two
3 that I would single out.

4 Q If I could have Exhibit 4004 brought up, please, and it's
5 also in the notebook in front of you behind Tab 4.

6 A Okay.

7 Q Is this a copy of your CV that was current at the time you
8 provided it along with your expert report in this case?

9 A That's correct.

10 Q And on pages 2, 3, and 4 of your CV, do you summarize your
11 publications?

12 A Yes.

13 Q And you've written the authoritative textbook on *Bayesian*
14 *Analysis for the Social Sciences*?

15 A I have.

16 Q And how is that used?

17 A It is used in master's and Ph.D-level courses around the
18 world in statistics and in social science settings as well.

19 Q Your CV indicates, am I right, that you have approximately
20 30 articles published in refereed journals?

21 A That's correct.

22 Q Do any of those articles relate to the work that you did
23 in this case?

24 A Yeah, they do. Some of my very first publications,
25 designated "A1," "A2," "A3," "A5," deal directly actually with

1 many of the issues that arise in my report and in this matter.

2 Q And did you calculate measures of partisan asymmetry as
3 part of your research for those or other articles?

4 A Yes, absolutely I did, yes.

5 Q And what about the most recent article listed here, "A30"?

6 A Yeah, that is an article looking at a method called
7 "uniform swing" as a predicative tool in forecasting election
8 results in the United States.

9 Q And then if we turn to page 6 of your CV, does that
10 summarize some of the significant awards you've received during
11 the course of your career?

12 A Yes, it does.

13 Q Now, have you testified as an expert witness in any other
14 case?

15 A Yes, I have.

16 Q Which case was that?

17 A *Gill v. Whitford* in Wisconsin.

18 Q And were you accepted by the Court as an expert and
19 testified in the trial of that case?

20 A I was.

21 Q And did you testify about some of the same subject matter
22 that you'll be testifying -- that's the subject of your report
23 in this case?

24 A Yes, indeed.

25 MS. EARLS: Your Honor, I tender Dr. Simon Jackman as

1 an expert in statistics, election forecasting, and American
2 political institutions.

3 JUDGE OSTEN: Any objection?

4 MR. STRACH: No, Your Honor.

5 JUDGE OSTEN: All right. He is -- the motion is
6 granted, and he will be allowed to render his opinion in the
7 areas of American political institutions, elections, and
8 election forecasting, and the application of statistical
9 methods in political science.

10 MS. EARLS: Thank you, Your Honor.

11 BY MS. EARLS:

12 Q Dr. Jackman, what were you asked to do in this case?

13 A There were really five things I was asked to do. First of
14 all, to assess the extent to which the districting plan in
15 place for North Carolina's 2016 congressional election
16 exhibited partisan asymmetry, number one; number two, to assess
17 and to compare the properties of different measures of partisan
18 asymmetry; number three, to assess the question of whether
19 there was a threshold value at which a measure of partisan
20 asymmetry might raise a concern or be -- or signal that a plan
21 ought to attract judicial scrutiny; number four, to assess how
22 durable partisan asymmetry is over the life of a districting
23 plan; and then, finally, having done all that, to put what we
24 see in 2016 from North Carolina in a broader setting, in a
25 broader comparative setting, to put it up alongside other

1 elections in recent American political history to assess --
2 and, therefore, to assess the level of partisan asymmetry we
3 see in North Carolina 2016.

4 Q Now, before we go any further, I think it would be helpful
5 if we define some of the terms that you've just used in
6 describing your analysis in this case. What is partisan
7 asymmetry?

8 A Partisan asymmetry in this context refers to the property
9 that -- the translation of votes into seats, right. That's
10 what districting plans do. They take votes on the ground, they
11 draw lines around voters, and we call those districts or seats.
12 It's that translation of votes into seats. Is that translation
13 of votes into seats the same for both sides of politics?

14 So as Democrats increase their vote share, presumably
15 they will win more seats. As Republicans increase their vote
16 share, presumably they will win more seats, but is the rate at
17 which increasing vote share is generating increased seat share,
18 is that mapping, if you will, the same for both sides of
19 politics? Are those mappings symmetric with respect to the
20 Democrats and to the Republicans, or are they not? And if they
21 are not, we say they are asymmetric.

22 Q How long has this concept been discussed in political
23 science literature?

24 A This goes way back actually. You can find articles
25 beginning to grapple with this literally from the turn of the

1 20th century in the statistics literature. The progression is
2 actually rather slow, but by the middle of the 20th century,
3 this is coming -- it's becoming less a statistics problem and
4 more a political science problem. Through the '70s, 80s, and
5 90s, this property of partisan asymmetry in the political
6 science literature is called "partisan bias," is the operative
7 term for it, and I guess it's really in the last 20 years that
8 the term -- the more encompassing term "partisan symmetry" or
9 "partisan asymmetry" has become more widely used, and I think
10 that's, frankly, a better way to think about what this problem
11 is fundamentally all about.

12 Q And what are some of the common ways it's measured today?

13 A There are three widely used measures. I just referred to
14 partisan bias. That's been with us the longest, but the
15 literature has got some other proposals: The mean-median
16 difference, which maybe we can define later on, and one that I
17 spent a lot of time analyzing in my report, the efficiency gap.

18 Q And so what is the efficiency gap?

19 A Sure. So two words, efficiency gap. Let's take the gap
20 piece first. That refers to the partisan asymmetry I was
21 referring to. Is there a gap between the parties with respect
22 to the way their votes are translated into seats? And
23 efficiency gets at this idea of how are you using your votes?
24 How are your votes being grouped into districts such that
25 there's an efficient mapping from your support on the ground

1 into your seats in the legislature, and is that mapping less
2 efficient for one side of politics than the other? That's what
3 the efficiency gap is fundamentally trying to measure.

4 Q And in talking about the efficiency gap, is it common to
5 talk about wasted votes?

6 A Yeah, at its core, the efficiency gap rests on this
7 concept of wasted votes. And so what is a wasted vote?

8 Q Yes, thank you.

9 A A wasted vote in this context means a very specific thing.
10 If I lose a seat, none of the votes cast for me in that seat,
11 for my party in that seat, generated a seat in the legislature.
12 So from this very particular sense of the word "wasted," those
13 votes are wasted. They did not generate a seat for me. That's
14 for the loser in a given seat.

15 For the winner in a given seat, votes in excess of
16 what they needed to win the seat, right, too many votes are
17 there for them, those votes could be allocated somewhere else
18 in the pursuit of a seat. So from that sense, winning by too
19 big a margin is also wastage in this very particular sense of
20 the way we're using the word "wasted" here.

21 So those are the senses in which we have wasted
22 votes. So there are wasted votes for the winner in a seat.
23 There are wasted votes for the loser in a seat.

24 Q So then can you tell us how the efficiency gap is
25 calculated in general terms?

1 A Sure. So what we do is in each district, we look at the
2 wasted votes for the winner, we look at the wasted votes for
3 the loser, and we would sum those over the districts in a
4 jurisdiction, and we would compare the wasted votes for the
5 Democratic candidates, we would look at the wasted votes for
6 the Republican candidates, we would sum those up and look at
7 the difference between the two, and that's the gap at that
8 point. Are there more wasted votes for the Republican or for
9 the Democrat, or Democrats, plural?

10 MS. EARLS: I would like to ask that we bring up
11 Plaintiffs' Exhibit 3023, and I believe this exhibit has
12 already been admitted by the Courts' order that all exhibits
13 not objected to are admitted.

14 BY MS. EARLS:

15 Q And I would ask you to turn to page 2 of that exhibit, and
16 it's on the screen in front of you as well. That shows the
17 Democratic and Republican votes in the 2016 congressional
18 elections, and my question for you is -- and I'm referring now
19 to the box on the right-hand side of page 2 of Exhibit 3023.

20 JUDGE OSTEN: All right.

21 MS. EARLS: I'm sorry.

22 JUDGE OSTEN: I either need a copy or we're going to
23 have to move that easel because I can't -- my eyes aren't good
24 enough to see either one really, but I've got a better shot at
25 that one.

1 JUDGE BRITT: I was going to make the same
2 observation, but I really can't see. Oh, that helps.

3 MS. EARLS: Is it visible now?

4 JUDGE OSTEN: I can see it now.

5 MS. EARLS: Thank you.

6 BY MS. EARLS:

7 Q And my question for you is using those election results --
8 statewide election results -- or I should say, by district the
9 election results in the 2016 congressional elections, would you
10 be able to calculate the efficiency gap?

11 A Oh, absolutely, yeah. And, indeed, I did.

12 MS. EARLS: Your Honors, at this point I would like
13 to ask permission for the witness to step down and use the
14 paper.

15 JUDGE OSTEN: Stay close to the microphone.

16 THE WITNESS: Absolutely.

17 MS. EARLS: So I'll let the record reflect, I've
18 asked Dr. Jackman -- I've handed him a marker.

19 BY MS. EARLS:

20 Q And there's a calculator as well there for your use.

21 A Okay.

22 Q And so to calculate the efficiency gap for the 2016
23 congressional elections, can you just put that on the top of
24 the --

25 A Sure. So we're in District 1. So I'll just write that at

1 the very -- I'll just write that at the very top.

2 JUDGE OSTEEEN: All right. Let's -- you're going to
3 be using numbers off what's on the screen?

4 THE WITNESS: Yes, indeed, I will in just a second.

5 JUDGE OSTEEEN: They just tricked you and took them
6 away.

7 THE WITNESS: I can still see them there.

8 JUDGE OSTEEEN: I hate to block you out. You can move
9 if you need to, but I think it would be better if you move the
10 whiteboard over so that we can see both the screen and the
11 whiteboard.

12 THE WITNESS: Yes, sir.

13 JUDGE BRITT: There you go. That's good.

14 BY MS. EARLS:

15 Q So the column under -- for District 1 for Democratic votes
16 shows that the Democratic candidate in 2016 received 240,661
17 votes, and the Republican candidate in District 1 received
18 101,567 votes. Using those numbers, what do you do next to
19 calculate the efficiency gap?

20 A Right. So remember the definition of wasted votes. In
21 District 1, the Democrat has won, the Republican has lost, and
22 we will, for the purposes of this calculation, ignore the
23 relatively tiny number of votes for other here, and, indeed,
24 District 1 is the only district in which any votes for others
25 are recorded. So we'll just put those to one side for the

1 purposes of focusing on the main game, if you will, the
2 Democrat v. Republican comparison here.

3 The Republicans lost. So consistent with the
4 definition I gave before, from the Republican's perspective,
5 all of those votes are wasted, right. 101,567 votes were cast.
6 They yielded zero seats. All right. So votes cast that do not
7 generate a seat are considered wasted. So the Republicans'
8 wasted votes here are all of the 101,567.

9 The next thing we need to do is to figure out how
10 many of the votes cast for the Democratic candidate are wasted
11 votes. 240,661 were cast, but the question we have to ask is
12 what did the Democrat actually need to win, and the answer is
13 to take the total votes, divide by two, plus one, right. That
14 was the number of votes that the Democrat needed to win.

15 At this point, I'll resort to a hand calculator here,
16 and I'll note that we have 240,661 plus 101,567. I take that
17 number, which is 342,228, divide by two and plus one, and I get
18 171,115. So that's votes to win was 171,115.

19 And now the Democrats wasted votes are 240,661 in
20 excess of 171,115. So simple subtraction, we're going to take
21 240,661 subtract 171,115, and I get 69,546 wasted votes for the
22 Republican [sic], 69,546. And we're done for District 1.

23 Q So you can return.

24 MS. EARLS: And I'll just mark that as a
25 demonstrative exhibit for the purposes of the record. I

1 believe that would be 4079.

2 JUDGE OSTEEEN: Any objection to that, Mr. Strach?

3 MR. STRACH: No, Your Honor.

4 MS. EARLS: Your Honor, if I may, at the break I can
5 add an exhibit sticker to that.

6 JUDGE OSTEEEN: Just take a pen and write the number.

7 MS. EARLS: Okay, thank you, Your Honor.

8 JUDGE OSTEEEN: PX4079 is admitted for demonstrative
9 purposes.

10 MS. EARLS: I would like to bring up Plaintiffs'
11 Exhibit 4078, which is also a demonstrative exhibit, and I have
12 copies to provide.

13 BY MS. EARLS:

14 Q And, Dr. Jackman, this is in the notebook in front of you
15 as well behind Tab 78.

16 A Sure.

17 Q Did you -- did you do that exact same calculation that you
18 just showed us for District 1 for the remainder of North
19 Carolina's congressional districts using the election returns
20 from the 2016 congressional ?

21 A Yes, I did.

22 Q And are those the numbers that appear on the chart that is
23 Plaintiffs' Demonstrative Exhibit 4078?

24 A Yes.

25 Q So then can you describe for us, using this chart, how you

1 ultimately calculate the efficiency gap for that election?

2 A Sure. So I just stepped us through the calculations for
3 the first district, and you can see that in the first row we
4 have the results of my calculation, the wasted Democratic votes
5 that I computed manually, 69,546, and we also see in the top
6 right the wasted Republican votes in this instance, 101,567.

7 Now, we just repeat that logic, that very simple
8 calculation across the 13 districts, and then we sum, and we
9 have two sets of wasted votes now, two wasted vote totals. The
10 Democratic wasted votes summed over the 13 districts, we get
11 1,592,124, the wasted Republican votes 702,859, and now we want
12 to compute the efficiency gap, right. So now it's about the
13 difference between these wasted-vote totals for the two
14 parties.

15 So when we define the efficiency gap as Republican
16 wasted votes minus Democratic wasted votes -- and to convert
17 that to a percentage, we will then just divide by the total
18 number of votes cast for the two parties, and so that's the
19 calculation that you see in the very bottom row of this chart.
20 You'll see the 702,859 wasted Republican votes. That's in red.
21 We will then subtract the 1,592,124 wasted votes for the
22 Democrats. That's in blue. All right. So we have that
23 difference, and then we divide by the sum of the total votes,
24 which is just the 2.4-million-odd and the 2.1-million-odd for
25 Republican and Democratic candidates respectfully, and again

1 just nothing more than, you know, simple algebra, and we get
2 simple arithmetic, and we get negative 19.4 percent as the
3 calculated efficiency gap for North Carolina in 2016.

4 Q And is that negative 19.4 percent an efficiency gap in
5 favor of which party?

6 A Oh, right. So the sign here, the fact that it's negative,
7 indicates that it is an efficiency gap indicating that
8 Republicans are wasting fewer votes than Democrats. We define
9 this conventionally as wasted Republican votes minus wasted
10 Democratic votes. That quantity, therefore, is negative.
11 That's indicative of Republicans wasting fewer votes or, if you
12 will, the districting plan exhibiting a tendency to favor
13 Republican candidates.

14 If, on the other hand, the efficiency gap is positive
15 in sign, it means that Democrats are wasting fewer votes than
16 Republicans, indicative of an electoral system or a districting
17 plan that manifests advantage for Democratic candidates, and
18 that is just merely conventionally. Nothing turns on that.
19 It's left to right, Democrat to -- we could have easily done it
20 the other way. It's just conventional to do it R minus D as
21 opposed to D minus R .

22 Q And looking at this table, is there data here that allows
23 you to understand why the efficiency gap was negative
24 19.4 percent in that election?

25 A Yeah, and so this is what I especially like about the

1 efficiency gap, by the way. It is tied to the results
2 themselves on the ground. We can literally eyeball -- the nice
3 thing about North Carolina is it's just 13 districts. We can
4 literally see them all in a spreadsheet and just eyeball what's
5 going on here.

6 We can see in the districts that Democrats have won,
7 and there are three of them in North Carolina in 2016 -- we can
8 see that the Democrats win by relatively large margins. For
9 instance, District 1, 240 -- 241,000-odd to 102,000-odd for
10 Republicans. That produces the Republican's wasted votes,
11 right. That's where their wasted-vote scores are getting
12 pretty high, but you see over the rest of -- so I'm going to
13 identify 1, there's 4, and then we can go down to 12, right,
14 where we see the Republican vote -- wasted-vote numbers in the
15 hundreds of thousands breaking 100,000, but look elsewhere,
16 look elsewhere. Look over at the other ten districts, and you
17 will see Republican wasted-vote tailles that are quite small
18 relative to the Democrat wasted-vote numbers, which are
19 generally much larger.

20 And that gives us some insight as to what's going on
21 here, that the three districts that the Democrats won, that's
22 the place where Republican votes are wasted; but where
23 Republicans are winning, they're doing so quite literally very
24 efficiently with very few wasted votes, and that's the sense in
25 which this electoral system is giving, on its face at least,

1 the ability for Republicans to translate their votes into seats
2 much more efficiently than Democrats are translating their
3 votes into seats.

4 And so we get this -- the final number that pops out
5 has this very tight connection to the actual facts on the
6 ground or the actual election results.

7 Q Now, when was this concept of the efficiency gap first
8 developed as a measure of partisan asymmetry?

9 A There are two articles in the literature where this really
10 comes together. Political scientists have been talking about
11 wasted votes for a long time in the sense of efficiency. These
12 ideas have been in the literature, but they really come
13 together in a piece by Eric McGhee in *Legislative Studies*
14 *Quarterly* in 2014 where he puts the two -- this idea that we're
15 going to compare wasted votes for Republicans and wasted votes
16 for Democrats. That's the -- and build an index out of that.
17 That comes together in that piece, and then the word itself,
18 "efficiency gap," is due to an article by Stephanopoulos and
19 McGhee, which appeared in *The University of Chicago Law Review*,
20 and it circulated as a working paper for a little while before
21 it finally appeared in print.

22 Q And in your opinion, is it a valid and reliable measure of
23 partisan asymmetry?

24 A Yes.

25 Q And why do you think it has value?

1 A Well, number one, it's so simple. You don't need a Ph.D
2 in statistics to compute this thing. Literally with nothing
3 more than a hand calculator or an Excel spreadsheet, any one of
4 us, I think, could go off and produce that calculation. There
5 is no algorithm. There is no recourse to simulation. There is
6 no modeling. There is literally counting and adding and
7 subtraction and a little bit of division at the very end.
8 That's nice. It's simple.

9 The other thing is, as I was just explaining, it
10 is -- and for that reason, it is closely connected to
11 real-world election results. You're not imagining other
12 elections that might have happened but didn't. You're not
13 asking yourself what if this district had been drawn that way
14 or this or that. You are literally taking the facts of this
15 particular election, and any other election for that matter,
16 and counting up what happened. You are not engaging in
17 speculation about hypothetical other elections or this or that.
18 You are computing it literally off official election returns.

19 Q And does it operationalize what's wrong with partisan
20 asymmetry?

21 A Yes, it does, right, again because of this deep connection
22 to wasted votes; and, indeed, as a measure of the extent to
23 which a plan is gerrymandered, I think it's got considerable
24 merit because of this idea of wasted votes is picking up
25 exactly the mechanisms of gerrymandering, as we refer to them

1 euphemistically, "packing and cracking."

2 If we could bring that table back up for a second,
3 the packing that we, you know, typically associate with these
4 lopsided Democratic wins is manifest in the large number of
5 wasted Republican votes there, but there are only three such
6 districts, and then the cracking is manifest in the very
7 efficient way, the low numbers of wasted Republican votes in
8 the remaining ten districts, but the relatively high numbers of
9 wasted Democratic votes. So packing and cracking is picked up
10 by this concept of wasted votes and summarized into an index in
11 a very nice tidy, simple-to-understand way.

12 Q So let's turn to the other measures of partisan asymmetry
13 that you mentioned. Can you define for us what partisan bias
14 is?

15 A Sure. So partisan bias asks us to contemplate an election
16 that is decided 50/50, right, where the statewide share of the
17 votes split perfectly evenly; and then if the election were
18 decided that way, if that's the way the election came out, it
19 asks then would the seats split 50/50, and --

20 Q And --

21 A Pardon me.

22 Q I'm sorry. Continue.

23 A And if they did not, if it appears that a 50/50 split of
24 the vote would not yield a 50/50 split of the seats, we say the
25 districting plan is biased in favor of the party that would win

1 more than 50 percent of the seats, if it won 50 percent of the
2 vote and is biased against the other party that would win less
3 than 50 percent of the seats if it were able to win 50 percent
4 of the vote.

5 Q And, just briefly, how is that calculated? How is
6 partisan bias calculated?

7 A So a simple method, and perhaps the most popular method,
8 the most widely used method, for computing partisan bias is to
9 take a set of real-world election results, like these ones, and
10 then shift the whole state back or up to or down to or up to
11 the 50/50 point, and then you literally look at -- some seats
12 may change hands under that scenario. If I were to add a
13 little bit to the Democrats or subtract a little bit from the
14 Republicans, say, to get to 50/50, you may see under that
15 simulation exercise a seat change hands. Then literally you
16 look at who wins each seat under this new world we've moved the
17 election results into. You literally cannot prove who wins the
18 seats under that scenario, and you get the seat share out of
19 that, and is it 50/50. And to the extent it's not, we've got a
20 measure -- you know, the difference from 50/50 is the measure
21 of bias in the system.

22 Q And then what is the mean-median difference?

23 A So the mean-median difference is, again, right, all of
24 these things are trying to pick up asymmetry, partisan
25 asymmetry, and so the mean-median difference says let's look at

1 the distribution of vote shares for say -- let's just, for the
2 sake of argument, take Democratic candidates across the state.
3 Let's look -- so in the case of North Carolina, that's 13
4 numbers. So there are 13 numbers, and they have a mean, those
5 13 numbers have an average, and those 13 numbers have a median;
6 and if the distribution of Democratic vote shares is skewed,
7 that is to say, the distribution is asymmetric, the mean will
8 not coincide with the median. That is in statistics a feature
9 of a skewed distribution, that the mean is pulled in the
10 direction of the skew, and a simple indication and, indeed, a
11 measure of skew is the extent to which the mean is different
12 from the median, and it's as simple as that.

13 Q So how do you define proportional representation?

14 A Proportional representation is the property in an
15 electoral system that you get as many seats in the
16 legislature -- you get -- the proportion of seats you get in
17 the legislature is equal to -- deterministically equal to the
18 proportion of votes you got in the election.

19 Q So can you explain in basic terms how partisan asymmetry
20 is different from proportional representation?

21 A Yeah, this is very important, I think, for everybody to
22 understand that there is nothing in an insistence on partisan
23 symmetry that ties you to proportional representation. They
24 are quite distinct concepts. Single-member district systems of
25 the sort we have in many, many places in the Democratic world,

1 but including North Carolina, typically do not generate
2 proportional representation. It is not the case in a
3 single-member district system that either deterministically or
4 just empirically that a 1 percentage point increase in vote
5 yields a 1 percentage point increase in seats. That's just not
6 what happens either by design or by accident. It does not work
7 that way.

8 Partisan symmetry is merely -- again, it's a weaker
9 property, if you will. All it insists on is that the mapping
10 from votes into seats is the same for both sides of politics.
11 It does not say if I get 55 percent of the vote, I have to get
12 55 percent of the seats. Empirically, over the long run in
13 American politics, in American congressional elections, if you
14 get 55 percent of the vote, you're probably going to do a
15 little better than 60 percent of the seats, right, maybe
16 65 percent of the seats. You are not going to get 55 percent.
17 You're going to do better than that.

18 Conversely, if you get 45 percent of the vote, you're
19 not going to get 45 percent of the seats, right. You're going
20 to do worse than that, but partisan symmetry just insists that
21 whatever that mapping is -- and it typically is not
22 proportional. In fact, it is not proportional. I think we can
23 just assert that -- that it be the same for both sides of
24 politics.

25 Now, at the 50/50-point, yeah, they coincide, right.

1 The one point, and there's only one point, where partisan
2 symmetry will line up with PR, and that's right at the 50/50
3 point, right. If a system is symmetric, it will mean that if I
4 get 50 percent of the votes, I get 50 percent of the seats, and
5 so will you, by the way, but everywhere else, all it insists on
6 is if 45 yields 47, then that's true for you. It's true for
7 me. That's partisan symmetry. It is not PR.

8 Q Now, you stated that you were asked to look at the
9 durability of the efficiency gap and partisan asymmetry in the
10 North Carolina plans. What do political scientists mean by
11 durability when used in connection with partisan asymmetry?

12 A Sure. That in the particular case of the United States,
13 districting plans -- other than courts intervening or whatnot,
14 districting plans are in place for a decade, and, that is, over
15 the life of a districting plan, are its properties with respect
16 to symmetry or asymmetry enduring, that is, such that if we see
17 a given level of asymmetry in the plan's design and in the
18 plan's first election, say, that that is something that we can
19 infer will be present over the subsequent elections of -- in --
20 of the -- over the plan's duration.

21 Q Now, did you prepare a report on the work that you did in
22 connection with this case?

23 A I did.

24 Q If you would turn to Tab 1, Exhibit 4001 in the notebook.

25 A I'm looking at it.

1 Q Can you identify what that is?

2 A That is a copy of the report I submitted in March of 2017.

3 Q And if you would next turn to Exhibit 4002 behind the
4 second tab in the notebook, can you identify what that exhibit
5 is?

6 A That is an update, an amendment to the report I submitted
7 in this case. This one dates from April.

8 Q And can you tell us, why did you amend your report in
9 April?

10 A Yeah, after we submitted my report, it was -- experts from
11 the other side in this matter pointed out there were a couple
12 of niggling errors with respect to a tiny part of the analysis.
13 I looked at over 8,000 congressional elections at the district
14 level, and in 58 of them, I had some wrong numbers, which
15 Defendants' expert was gracious to point out to me, and we took
16 the opportunity to go back and correct those numbers; and,
17 moreover, there was some text accompanying one of the graphs
18 that was -- hadn't been updated from an earlier draft, and,
19 literally, the words on the page didn't match what was in one
20 of the graphs, and, again, it was Defendants' expert that
21 pointed that out, and, again, we took the opportunity for me to
22 go and amend that part of the report as well.

23 JUDGE OSTEN: All right. Let me stop you there.
24 Speaking of graciously, we're going to take a mid-morning
25 recess. We'll be in recess for 15 minutes.

1 (At 10:24 a.m., break taken.)

2 (At 10:45 a.m., break concluded.)

3 JUDGE OSTEEEN: You may continue, Ms. Earls.

4 MS. EARLS: Thank you, Your Honor.

5 BY MS. EARLS:

6 Q Before the break, we were looking at why you prepared an
7 amended report, and you mentioned that out of the over 8,000
8 separate district elections that you examined, there were 58 in
9 which the data was not correct. Did you discover why that
10 happened?

11 A Yeah, in the course of my work, I inadvertently transposed
12 two columns in the data, and in a column where there was
13 supposed to be vote counts, the year of the election had been
14 put in there, which looked like a number, just a very low
15 number, and so that was picked up by -- and we fixed that.

16 Q Right. So once you made the correction, you reran your
17 numbers. And did those errors impact your conclusions in any
18 way?

19 A No, not at all, and the answer is because it's such a
20 small proportion of the overall data set.

21 Q Now, let's look at the data that you did use in preparing
22 your report. If I could have brought up on the screen
23 Exhibit 4002 at page 2 of that exhibit.

24 A Yeah, so that's the part of the report where I detail the
25 data I used in the analysis. The single largest collection of

1 data is this data set on congressional election returns
2 maintained by Harvard that is canonical inside political
3 science. That data collection runs up through '92, and '92 to
4 the present. Its *Congressional Quarterly* have a nice
5 collection of congressional election returns; and then at
6 various parts of the analysis, I relied on having presidential
7 election results tabulated at the level of congressional
8 districts. And inside political science the go-to professor
9 for that is Gary Jacobson, perhaps the most distinguished
10 scholar of Congressional elections in the country. He is the
11 keeper of those data for political science.

12 Q And then if you'll turn to page 67, at the end of this
13 expert report, there's a list of references. Is that also
14 material that you relied on for your report?

15 A Yes.

16 Q Now, using this data, what analysis -- very broadly and
17 generally, what analysis did you perform?

18 A I computed efficiency gap scores in -- which, remember, is
19 a state-level or jurisdiction-wide quantity. So my analysis
20 yields an efficiency gap score in 512 elections conducted,
21 congressional elections at the state level, 1972 to 2016,
22 covering 25, 26 states, and those data also span 183 different
23 districting plans; and then that gave me, you know, frankly,
24 the most comprehensive database we have for examining these
25 partisan asymmetry measures, the efficiency gap in particular,

1 and, again, perhaps the most comprehensive set of data we have
2 for putting North Carolina 2016 in some context.

3 Q And so does this analysis relate to the second prong of
4 the League Plaintiffs' proposed standard; namely, whether
5 there's a large and durable discriminatory effect from the
6 partisan --

7 A Yes, indeed. As I understand the totality of the
8 argument, my work speaks to the magnitude of the asymmetry, its
9 durability, the extent to which it is a property of a plan. It
10 does not speak -- intent and whatnot were beyond the scope of
11 my report.

12 Q And what overall conclusions did you draw from that
13 analysis about the North Carolina 2016 congressional districts?

14 A So we had a chart up earlier that showed that efficiency
15 gap score that we compute for North Carolina in 2016 of
16 negative 19.4 percent. In and of itself, that doesn't tell us
17 very much, but it's the comparative analysis I undertook
18 situating that number in the context of a large number of other
19 congressional elections that helps us understand it; and when
20 you do that, you discover a couple of things. One is that is
21 an extremely large efficiency gap score. In fact, it is the
22 largest efficiency gap score obtained in 2016 in my analysis.
23 It's the third largest in North Carolina's history, surpassed
24 only by those seen in 2012 and 2014. It is durable. It is so
25 large that for it to be sent back -- for this plan to start to

1 produce results consistent with a benign level of the
2 efficiency gap, we would be looking at Democrats picking up
3 about an 8 or 9 percent swing toward them, a swing that has
4 only been seen once in North Carolina's recent political
5 history. In the Watergate election of 1974, there was a
6 massive swing towards Democrats. It's a political upset of
7 that magnitude, of that historic magnitude, frankly, that would
8 take negative 19.4 and send it back somewhere in a benign
9 neighborhood of zero, and that sort of speaks -- and that's --
10 my analysis over time and over many states gives me the basis
11 for putting that negative 19.4 in some context.

12 Q So I would like to start first with looking a little
13 closer at your analysis of the efficiency gap scores of all
14 congressional redistricting plans from 1972 to 2016, and you
15 mentioned that you looked at certain states. If we could turn
16 -- have up on the screen and turn to page 19 of Exhibit 4002,
17 and does that list there the states that you looked at?

18 A It lists -- the two bullet points there identify states
19 that are not in the analysis, and so there's -- because they
20 have six or fewer congressional districts, and Louisiana is
21 also out because of its -- because of its run-off system, and
22 then at various points, South Carolina, Kentucky, Colorado, and
23 Arizona are only in for part of the period '72 to '16 because
24 they're dropping below that seven-seat minimum.

25 Q And why did you impose that seven-seat minimum?

1 A Yeah, the efficiency gap, because of the way it's
2 computed, gets a little sensitive once you get down to
3 extremely small numbers of seats.

4 Q And what do you mean by "sensitive"?

5 A It means that a change in who wins the seat can produce a
6 big change in the efficiency gap; and when we're down to four
7 seats, say, one in four is not implausible at all, and that's
8 the circumstance in which, you know, you would want to do that
9 analysis almost -- take -- because it's so particular, you
10 would want to do apples to apples, and so you would want to
11 analyze all the four state -- four-seat states. I would want
12 to analyze all the five-seat states. I would want to analyze
13 all the six-seat states. So I would want to do those in bins,
14 if you will, and straighter. I'm much more comfortable putting
15 7 to 15 or 15 and above in their own buckets, but down -- well,
16 there's no redistricting to do in the at-large states. States
17 with two congressional districts, redistricting isn't that
18 interesting. Threes, fours, and fives and so on, I would want
19 to do the analysis in bins particularly there, and I didn't do
20 that in this case. We've got an awful lot of data in the
21 seven-and-up category. My calculations are that states with
22 seven CDs or more comprise -- currently comprise 82 percent of
23 the Congress. So I was quite comfortable with that restriction
24 imposed on my analysis as to the data that entered my analysis.

25 Q And if we could look at page 21 of Exhibit 4002, Figure 4,

1 what does that show?

2 A That is a graphical summary of the data that are in, and
3 each orange square is a state year pair, and so you can see --
4 it just indicates where we've got data, and you can see South
5 Carolina coming in at the very end. You can see Arizona coming
6 in in the 2000s. You can see Kentucky dropping out after
7 the -- after the '80s, and then the horizontal lines group
8 states and years by the redistricting plan in place. You see
9 the decade-type sequencing there in the sense that a
10 redistricting plan comes in on the two-year, and in some cases,
11 it's subject to court challenge or is amended, and there's a
12 few interruptions; but what you tend to see is this pattern of
13 five election sequences being held under the same plan,
14 modular, courts intervening or the legislature instituting a
15 new plan or things like that.

16 Q So to be clear, with regard to Figure 4, you calculated
17 the efficiency gap, the partisan bias, and the mean-median
18 difference for all of the elections represented on this chart?

19 A That's right. So I've got 512 efficiency gap scores that
20 come from the state year elections as indicated in Figure 4.

21 Q And in this analysis, what did you do when there were
22 uncontested elections?

23 A Right. So 14 percent of the roughly 8,000 district-level
24 data points do not have a D v. R, right, a Democrat running
25 against a Republican. The typical thing is a Democratic or

1 Republican incumbent being returned unopposed. 14 percent of
2 the data are like that.

3 You have a choice to make at that point. Are you
4 going to throw out the entire election, or are you going to
5 keep it in? Now, if you were to throw out the entire election,
6 you would be throwing away an awful lot of those 512 elections.
7 So the procedure that I adopt and others in the literature have
8 adopted is to fit a model that makes it an imputation for what
9 would have happened had there actually been a
10 Democrat-versus-Republican contest in that election. To make
11 that imputation, I rely on the presidential vote that we
12 observed in that district, either just before or just after, in
13 some cases, or contemporaneously with the uncontested election,
14 and also to take into account the incumbency of the district,
15 that is, who was the fortunate incumbent -- the party of the
16 fortunate incumbent that did not face a challenge. And any
17 imputation you would make has to satisfy the constraint that
18 that incumbent would win. If you couldn't attract a
19 challenger, any sensible model should impute a vote total for
20 that candidate about 50 percent.

21 So I did that for the 14 percent of the roughly 8,000
22 cases where we don't observe a two-party contest.

23 Q And is this imputation of data for uncontested elections
24 something that you have to frequently do in your analysis in
25 all sorts of contexts?

1 A This idea of using presidential vote as an indicator of --
2 or looking at the relationship between congressional voting
3 outcomes and presidential voting in the district is quite
4 common in political science, but in this context, again, it was
5 only 14 percent of the data, and I think an important thing for
6 everybody to understand is that North Carolina 2016 did not
7 give us any uncontested districts, and so we're in the happy
8 position of not having to bother with that, at least for the
9 case of 2016 North Carolina.

10 Q So, in other words, when you computed the efficiency gap
11 of the 2016 congressional districts in North Carolina, you
12 didn't have to do any imputations?

13 A No, I did not, no.

14 Q So let's turn to Figure 1 on page 2 of Exhibit 4002, and
15 can you tell us what that shows?

16 A Yes, so I mentioned that my analysis was 8,000 districts,
17 512 elections, 136 plans. Now we're at the level of 136 plans.
18 These are the 136 districting plans --

19 JUDGE OSTEEEN: Hold on a second. Where are you?

20 MS. EARLS: I'm sorry, Your Honor. This is -- it's
21 probably easier to see it in a notebook, and this is page 10 of
22 Exhibit 4002.

23 JUDGE BRITT: Well, it would be appreciated if you
24 would refer to it by the page number in the notebook.

25 MS. EARLS: I will, Your Honor, thank you.

1 THE WITNESS: So we're at Figure 1 on page 10, and
2 this has 136 dots, if you will, one dot for each districting
3 plan, and it's the average efficiency gap score that we observe
4 over the life of those 136 plans. And I've arrayed the dots,
5 if you will, from top to bottom, top being the most
6 pro-Democratic efficiency gaps we see, to the bottom of the
7 graph on the left where we see negative efficiency gap scores
8 consistent with Republican advantage, and I've used a little
9 bit of color to distinguish the North Carolina plan that
10 governed the 2012 and 2014 congressional elections, which is
11 the lowest, the most pro-Republican redistricting plan observed
12 over 136 plans, 1972 to 2016, in my analysis. And then the one
13 election that the current plan has generated -- we've seen
14 under the current plan, that is 2016, is one, two, three,
15 four -- it's the fourth most negative efficiency gap score, the
16 fourth most pro-Republican efficiency gap score observed over
17 the 136 plans that I examined.

18 BY MS. EARLS:

19 Q Now, if we could turn to page 27 of Exhibit 4002, and if
20 you would look at Figure 6, does that also show in a different
21 way the results of your efficiency gap analysis?

22 A Yeah, now, we're up at the level of the 512 elections in
23 my analysis, and this is a graphical device that we saw a lot
24 in court yesterday, a histogram, summarizing the distribution
25 of those 512 numbers, those 512 efficiency gap scores. The

1 height of the gray bars indicates that more data lies there
2 than at other places where the bars might be lower. So in this
3 case, we see that there's this bug clump -- relatively big
4 clump of data right around zero efficiency gap score --

5 Q I'm sorry. When you say there's a big clump of data, what
6 do you mean by that?

7 A I mean, in the preponderance of the data, the bars are
8 higher in the middle of the graph close to an efficiency gap
9 score of zero, meaning that over those 512 elections, on
10 average, we are much more likely to see an efficiency gap score
11 close to zero than we are likely to see an efficiency gap score
12 either taking on a large pro-Democratic positive magnitude or a
13 large pro-Republican negative magnitude. Most of the data lie
14 in the middle.

15 Q And then what is the red and blue lines on this?

16 A Yeah. So I've used, again, color to highlight where
17 recent North Carolina elections -- the efficiency gap scores
18 associated with those elections line up in the 512 elections
19 spanned by my analysis, and they lie far out in the left-hand
20 tail of this distribution. You can see the blue line for 2016,
21 and you can see the red and almost superimposed line -- the
22 black line for 2014 and 2012 respectively, again some of the
23 more extreme efficiency gap scores I saw in my analysis
24 spanning 44 years and 512 elections.

25 Q And what were you able to conclude as a result of this

1 analysis?

2 A The unusual nature -- the unusually pro-Republican nature
3 of the efficiency gap scores and of the plans that created them
4 for North Carolina. I concluded that, on average, efficiency
5 gap scores close to zero are not at all unusual over 44 years
6 of American political history. What is unusual are efficiency
7 gaps -- and very unusual even are efficiency gap scores of the
8 magnitudes we've been observing in North Carolina in recent
9 elections; and over the body of the report, I then went on to
10 explore the durability of a score like the one we saw in 2016
11 relative to the patterns of durability we see with efficiency
12 gaps in the historical record.

13 Q So I do want to talk more about your durability analysis,
14 but I want to ask, first, did you do any analysis of the
15 national data to determine the operative consequences of the
16 efficiency gap?

17 A Sure.

18 Q And what do you understand by "operative consequences"?

19 A Yeah, okay, so what I wanted to do was to take these
20 numbers -- what is negative 19.4? What is it positive 19.4 for
21 that matter? What does that actually mean? Like it's big, and
22 this histogram that we just looked at tells us it's big in a
23 relative historical sense, but I want to do more than that. I
24 wanted to understand what does that mean in terms of actual
25 outcomes?

1 And so what I did was an analysis correlating
2 efficiency gap scores with the way that a particular
3 election -- the same election that generated a given efficiency
4 gap score, that same election generated a seat share that was
5 unusual relative to the vote share for a given party in that
6 election, and I did that calibration analysis, that
7 correlational analysis in states with small numbers of
8 congressional seats and slowly made them larger and larger and
9 larger, going up to the larger delegations like Texas and
10 California, to build, in my own mind, a sense of, you know, how
11 large is large for the efficiency gap. At what point could we
12 look at an efficiency gap number and say, I believe that that
13 efficiency gap number is associated with a seat or it's more
14 likely that a seat is going to be one way or the other as a
15 consequence or at least in a way that's related to this
16 efficiency gap score, so this calibrating efficiency gap scores
17 back to outcomes in terms of seats or the likelihood that a
18 seat will flip.

19 Q If you would turn with me to Exhibit 4002, page 37.

20 A The same document, right?

21 Q Yes. And I just want to ask you: Is that where you begin
22 your discussion of how large the efficiency gap must be to have
23 a politically meaningful outcome, such as a seat changing
24 hands?

25 A Yeah, this is where that part of the analysis begins in my

1 report.

2 Q And if you turn over then to page 41 of Exhibit 4002.

3 A Yes.

4 Q Does Table 2 report -- does that help you explain what
5 results you found?

6 A Yeah. So what I set about doing here, I present the
7 results in a table of this analysis I did to establish this
8 point at which the efficiency gap scores are more likely than
9 not to produce a measurable consequence like a seat changing
10 hands, and for small -- let's just take the column labeled
11 "Negative .05." That's the cut point between zero and negative
12 one. That's the point at which a one-seat deficit becomes more
13 likely than no change at all, and so I established that as a
14 threshold for my analysis, and in seven to eight seats, the
15 efficiency gap that's historically associated with that
16 half-seat point is negative .08. In states with nine to ten,
17 it's negative .06. In states with eleven to fifteen CDs, it's
18 negative .07.

19 And we can look at the column labeled "Positive .5,"
20 going the other way, and we see, you know, on the other side of
21 zero now a positive efficiency gap .07 for states with seven to
22 eight CDs; states with nine to ten CDs, we're talking .06; and
23 eleven to fifteen, we're down to .02, but you get a sense of
24 the analysis -- I'm coming up with a number -- an efficiency
25 gap number that puts us on the cusp of status quo versus we're

1 getting an outcome in terms of seats that departs from
2 historical norms.

3 Q So then for states with seven to fifteen congressional
4 seats, what did you conclude about what the efficiency gap
5 would be to mean that it's more likely than not that a seat
6 would change hands?

7 A For sure. So to summarize this, to make it easy to use,
8 what I did is I just took -- I looked at the biggest number in
9 the top half of those two columns we just went through, and
10 there's a negative .08, and I said let's take that as the
11 threshold, right. I erred on the side of conservatism, if you
12 will, taking the largest number I saw in that group of six
13 numbers, the top three rows of the middle two columns there. I
14 said let's take negative .08, and in states where the
15 congressional delegation is seven to fourteen seats, let's just
16 say that the threshold for an efficiency gap being so large
17 that it ought to cause us some concern that a seat -- we're
18 getting -- it's more likely that we're getting a seat deviation
19 than not. Let's take that at plus or minus .08.

20 And then in the bottom half of the graph, again, to
21 simplify this information, I said in states with larger
22 congressional delegations, I looked -- and I saw the biggest
23 number is .05, and so let's take as the operative standard plus
24 or minus .05 at the point at which we think an efficiency gap
25 is telling us that the plan is more likely than not to produce

1 at least a one-seat deviation from historical norms given the
2 vote shares.

3 Q So let's turn now to the analysis that you did to
4 determine whether it was possible to identify a threshold for
5 when a redistricting plan's efficiency gap might be durable?

6 A Um-hum.

7 Q And how did you assess that?

8 A So -- okay, so this is the second piece of the analysis.
9 I identified, first of all, these thresholds for when it looks
10 like a seat -- it's more likely than not that we're going to
11 see a seat changing hands as a result of the efficiency gap,
12 but then I have to ask a second question: Is that going to be
13 something we see over the life of the plan? Is that just a
14 one-off, or how do I know I'm seeing something -- that that's
15 going to endure over the plan?

16 And so I took advantage of the fact that I've got 512
17 efficiency gap scores that group into 136 plans, and so I
18 looked at the relationship between the first efficiency gap you
19 see under a plan and the average -- the average efficiency gap
20 over the remainder of the plan, and that puts ourselves in the
21 position, not unlike the one we find ourselves here, where
22 we've got a plan, it's generated one election result, we have
23 one efficiency gap score under the current North Carolina plan,
24 and the question we're asking ourselves is is it likely to stay
25 large over the life of the plan if we were to do nothing?

1 And that's what I used regression analysis and
2 graphical inspection of the data to understand, not just is the
3 efficiency gap big, not only does it trip that threshold, but
4 how big must the first efficiency gap you see under a plan be
5 in order for the plan average to be above the thresholds we
6 were just talking about in the earlier table.

7 Q So if we turn to page 54 of your report, Exhibit 4002,
8 does Table 3 at the top of page 54 -- does that summarize your
9 conclusions on this question?

10 A Yeah, it does. So what I've tried to do is to produce
11 this one table that summarizes a lot of the analysis that went
12 into my report. So the top row of this table refers back to
13 the plus or minus .08 and the plus or minus .05 we were just
14 talking about. The rest of the table identifies those -- now
15 it focused on the second question I was concerning myself with,
16 the relationship between the efficiency gap you see in the
17 first election and what you see over the remainder of the plan.
18 How large must that first election efficiency gap score be such
19 that you're comfortable, you're confident concluding that you
20 will see an average score greater than the threshold at the top
21 of the table? And the answer is -- in states with a small
22 number of congressional districts, the answer is plus or minus
23 .12, and in congressional delegations -- states with
24 congressional delegations that are larger, it's plus or minus
25 .075.

1 Q Now, did you also apply that durability analysis to North
2 Carolina's 2016 Congressional Plan?

3 A Yes, I did.

4 Q And so then if you would turn to me to page 52, this is in
5 Exhibit 4002, and look at Figure 19.

6 A Right.

7 Q Can you describe to us what Figure 19 shows?

8 A Figure 19 shows, again, using this graphical device of a
9 histogram summarizing, if you will, our uncertainty. We're
10 making a prediction. It's not going to be deterministic,
11 right. We're not going to determine this with absolute
12 certainty. So there is some uncertainty associated with our
13 predictions for what will follow under this current North
14 Carolina plan, but given that its first efficiency gap score
15 was negative .19, the probability that it will produce
16 efficiency gap scores consistent with Republican advantage over
17 the life of the plan is 99 percent. So based on the historical
18 relationship between the first efficiency gap score you see
19 under a plan and what happens afterwards, if I plug what we
20 currently got out of North Carolina in '16 into that analysis,
21 I can conclude that with 99 percent probability we're going to
22 get negative -- this plan will produce on average negative
23 efficiency gap scores, and, moreover, in excess of that actual
24 threshold, the probability of that is about 80 percent.

25 Q Now, isn't it possible that other factors, such as a

1 political scandal, a celebrity candidate, a huge disparity in
2 campaign spending could alter that outcome?

3 A That's correct. That's absolutely correct.

4 Q And how does your model take account those?

5 A All of those factors appeared in those 512 elections I
6 looked at, 1972 to 2016. The Watergate wave election is in
7 there. The '94 wave is in there. Obama is in there. Trump is
8 in there. All the things -- incumbents getting into trouble,
9 incumbents not getting into troubling, well-funded
10 challenges -- all the things that happened in the cut and
11 thrust of American politics that did happen in the cut and
12 thrust of American politics, I'm basing my analysis -- and my
13 conclusions and that uncertainty I just described to you comes
14 from the fact that the relationship between first election
15 efficiency gap score and planned average efficiency gap score
16 is not perfect, right, but, still, we're in a position in this
17 case where negative 19 is well in excess of those thresholds
18 that I identified.

19 And so notwithstanding all those other factors and
20 the way those other factors impinge and push election results
21 around, as reflected by the historical record, this negative 19
22 score, we are in a place where you can confidently conclude
23 those factors, notwithstanding that this plan will continue to
24 produce efficiency gap scores, wasting votes, if you will, that
25 favor Republicans over Democrats in a systematic and durable

1 way.

2 Q Did you do any sensitivity analysis to determine if the
3 efficiency gap in the 2016 North Carolina elections at
4 19.4 percent was just a fluke or would continue through the
5 rest of the decade?

6 A Well, in addition to the analysis I just described, I did
7 conduct some other analysis as well.

8 Q Can you describe for us what you did?

9 A Well, it is summarized in the report, but before we get
10 perhaps to the graph, I'll just describe it in words.

11 What we do is we take -- you heard me earlier
12 describing the uniform swing method. What we do is we take the
13 2016 set of results for North Carolina, and we subject them to
14 a shift one way or the other, shifting the entire state in a
15 pro-Republican way or in a pro-Democratic way; and holding
16 everything else constant, the district lines stay the same, the
17 incumbents stay the same, everything stays the same, we're just
18 assimilating a big year for Republicans or a big year for
19 Democrats, and, indeed, not just big years, but monster years.
20 We go right out to nine-point swings either way and ask
21 ourselves how would the efficiency gap score change, everything
22 else being constant, but a big wave coming in on one side of
23 politics or the other.

24 Q And is this swing analysis a type of analysis that is
25 commonly done in the field of political science?

1 A Yes, it is.

2 Q So let's turn then to page 58 of your report,
3 Exhibit 4002.

4 A Yep.

5 Q Looking there at Figure 21, does this show the results of
6 your swing analysis for the North Carolina 2016 Congressional
7 Plan?

8 A Yes, it does.

9 Q And can you tell us what this shows?

10 A Yeah, so the red square in the middle is the 2016 result,
11 right. So on the -- it is anchored at the zero point on the
12 horizontal axis. On the horizontal axis, we've got those
13 levels of swing, or wave, if you like; and as we go to the
14 right, positive swing is swing in favor of the Democrats, and
15 going the other way is swing towards Republicans, and the thick
16 black line, the values of the efficiency gap that would result
17 if we subjected the state to the given level of swing indicated
18 on the horizontal axis, and so the red square is what we
19 actually got in 2016, and efficiency gap score, if you read
20 over to the vertical axis, you'll see that's at about negative
21 19 -- negative .194, just slightly above the negative .2 line
22 there.

23 But if you swing towards the Democrats, you'll see
24 that the efficiency gap score is getting bigger and bigger and
25 bigger, and, indeed, finally turns the corner once we get out

1 to a swing of about, what is that, about 6 percent, and it
2 turns that corner because with a 6 percent swing, the Democrats
3 would pick up a seat under the current boundaries. We'd go
4 from 10-3 to 9-4, right. And then the efficiency gap is
5 actually coming back as we keep swinging, and then there's
6 another kink, and that's the point at which Democrats with a
7 swing of around about seven points would pick up a second seat.
8 That's the point at which we end up with 8-5; and then if we
9 keep going, you'll see there's even another kink way out on the
10 right almost at nine points of swing, and that's where we get a
11 third seat, and we're at 7-6 at that point, and the efficiency
12 gap at that point is way up back in what I would call benign
13 territory at that point, all right.

14 The point here being, and this is what I think this
15 graph makes rather vividly, is that you've got to go out that
16 far. You've got to go out to eight or better or even almost
17 nine points of swing to send this plan -- have it generate an
18 efficiency gap score that's back in benign territory, as
19 identified by my historical analysis and the thresholds we were
20 just talking about.

21 Q And across the horizontal axis along the bottom of the
22 chart, what are those little hash marks? What do they signify?

23 A They're the actual swings that we've seen in North
24 Carolina's political history 1972 to 2016, and you'll see most
25 of them are rather small. Most of those little tick marks on

1 the horizontal axis are reasonably close to zero. There's a
2 few Republican swings out there, around about five points, but
3 the swing towards Democrats we're talking about or the swing
4 towards Republicans, by the way, that would rationalize this
5 plan send the efficiency gap score back into benign territory
6 close to the zero point. We're talking a very, very large
7 swing, not just in absolute terms, but relative to the swings
8 we've seen in North Carolina's -- the last 44 years of
9 political history in North Carolina.

10 Q So then what does this data allow you to conclude about
11 the durability of the efficiency gap in the 2016 --

12 A For me, it's yet more evidence that speaks to the
13 magnitude of this efficiency gap and its durability in that we
14 are talking about a swing of historic proportions in order to
15 send that large efficiency gap back to a level under the
16 current lines, back to a level where we would say nothing to
17 see here. History tells us, right, historical records says
18 historically record things are rare. Therefore, it's quite
19 likely that this large efficiency gap will endure. About the
20 only thing that could lead us to a different place would be a
21 swing on a par with the largest swings we've seen in the last
22 40, 50 years of political history in this state.

23 Q Now, did you also do any analysis that allows to you draw
24 any conclusions about what caused the negative 19 percent
25 efficiency gap in North Carolina's 2016 plan?

1 A Yeah, again, so I've got 512 efficiency gap scores. They
2 span 44 years. They span many states. They span 136
3 districting plans. I'm able to ask the following question,
4 and, that is, which side of politics controlled the districting
5 plan -- or the districting process that generated each plan
6 and, in turn, generated the efficiency gap scores under that
7 plan, and is there any relationship between change in who
8 controls the districting process in terms of partisanship of
9 those people and the sorts of efficiency gap scores that
10 result, so, in essence, looking at the relationship between
11 partisan control of the districting process and the efficiency
12 gap scores that result.

13 Q And what did you conclude from that analysis?

14 A That in particular -- well, number one, no one has got
15 clean hands here. I think it's important to concede that
16 point. The historical record is quite clear on this, that
17 partisan gerrymandering by both sides of politics is real,
18 number one.

19 Number two, that in recent decades partisan control
20 of the redistricting process produces bigger efficiency gaps in
21 favor of the side of politics who has assumed control of the
22 districting process, and, no surprise, Democratic control of
23 the redistricting process tends to produce efficiency gap
24 scores consistent with Democratic advantage, that is, positive
25 efficiency gap scores. Courts and independent commissions, you

1 tend to get in the middle, closer to zero, in the neutral
2 point. Republican control of the districting process, you tend
3 to get negative scores. That has really become much more
4 apparent in the zero zeros and in the current decade.

5 The change -- if you change, as North Carolina did,
6 from Democratic control to Republican control of your
7 redistricting process, that almost perfectly accounts for the
8 change in the efficiency gap score we see in North Carolina
9 under the previous decade to the '12, '14, '16 set of scores.

10 Q And we'll look later at a chart that I think illustrates
11 that, but let me, before we get there, just ask you about the
12 prospective use of efficiency gap scores. And there I want to
13 know is it possible to use the efficiency gap measures before
14 there's any election under the newly drawn redistricting plan
15 to assess its partisan symmetry or asymmetry?

16 A Yes. So in this matter, we find ourselves with one
17 election under the plan, but you asked me about the case where
18 there's zero. That's interesting. So what would we do in that
19 case? Well, frankly, we would do what redistricters do and,
20 that is, as we heard in court yesterday, take previous election
21 results, many of them perhaps, tabulate efficiency gaps using
22 those election results but under the new proposed district
23 lines or the actual district lines, compute efficiency gap
24 scores that result from that either for Congress or with
25 perhaps even a model that used the other information, and we

1 heard yesterday about summary scores being computed out of up
2 to as many 20 statewide elections to help refine the estimates
3 of what's going on in a new district or new set of districts.
4 We could do that exercise.

5 And, further, to even make the results a little
6 robust, if you will, to any kind of reasonable assumption
7 about -- we don't know exactly what the next election -- it
8 could be a good election for Democrats because of national
9 forces. It could be a bad election for Democrats because of
10 national forces.

11 I would also engage in some of that analysis I just
12 described where we subject any assumption about what's going to
13 happen district by district to a swing one way or the other,
14 you know, of a reasonable magnitude of the sort that's sort of
15 in line with what we've been seeing in recent history, and then
16 trace out a set of efficiency gap scores that result from that,
17 and are they large or are they small relative to the benchmarks
18 I've testified to about today.

19 MS. EARLS: I'd ask that we bring up Exhibit 1017.
20 This is one of the joint joint exhibits that has already been
21 admitted. All the parties have offered this exhibit.

22 BY MS. EARLS:

23 Q And ask you, Dr. Jackman, this is data that was part of
24 the legislative record when this map was enacted. Is this the
25 kind of data that the legislature would examine -- if the

1 Supreme Court were to adopt Plaintiffs' standard in the
2 *Whitford* case, when a legislature is drawing districts in 20 --
3 after the 2020 Census, is this the kind of data they can rely
4 on to do the calculations that you just described and ensure
5 that they have not allowed partisan considerations to go too
6 far?

7 A Yeah, exactly. I'm inferring that AG means Attorney
8 General and so on, but I don't know exactly what these columns
9 refer to, but, absolutely, I would be using data like this and
10 perhaps presidential vote as well. There's many, many things
11 available to us to make inferences about the political behavior
12 of partisan composition of districts before we see them
13 actually produce -- they go out and vote in those new
14 districts, absolutely.

15 Q And so to be clear, they would use those election returns
16 and calculate the efficiency gap the way you showed us earlier
17 using a calculator?

18 A Sure, yeah, absolutely.

19 Q Let's turn to some of the other measures of partisan
20 asymmetry. Partisan bias, did you calculate the partisan bias
21 in North Carolina's 2016 Redistricting Plans?

22 A Yes, I did.

23 Q And what did you find?

24 A I found an extremely large value of partisan bias for
25 North Carolina in 2016, but also in 2012 and 2014.

1 Q So I would like to turn now to Exhibit 4003. This is your
2 rebuttal report, and first just page -- one of this -- I'll let
3 you identify what it is. Can you tell us what Plaintiffs'
4 Exhibit 4003 is?

5 A This is my rebuttal report.

6 Q Could you turn to page 4 of this exhibit? And can you
7 tell us what Figure 1 demonstrates?

8 A Yeah, Figure 1 shows the history of both efficiency gap
9 scores and partisan bias scores for North Carolina 1972 to
10 2016, and you will see that the partisan bias scores are in
11 blue and the efficiency gap scores are in red, and the question
12 you just asked me about the recent -- the most recent scores,
13 you'll see the extremely large value for partisan bias. The
14 right most dots, if you will, in the graph are for 2016, and
15 you'll see that the partisan bias score is larger in magnitude
16 than negative .25. We're down at negative .27 or so and the
17 larger set of partisan bias scores over -- in 44 years of North
18 Carolina history.

19 Q And does this graph also tell you anything about the
20 stability of the efficiency gap measure in North Carolina?

21 A Yeah, one of the things I'm struck by when I look at this
22 graph, we've got a rather impressive three election sequence
23 '12, '14, '16, at least with respect to partisan bias. You've
24 got to go back to the '90s when essentially you've got a bias
25 of zero to find a nice type stable sequence like that or even

1 back to the '70s where it's a small Democratic advantage, but
2 not only have we got historically large values of the
3 efficiency gap and partisan bias for North Carolina in the last
4 three elections, but they're very stable, and those -- that's
5 not a coincidence. Large and stable tend to go together with
6 these scores.

7 Q Did you also look at how the partisan bias of North
8 Carolina's districts in 2012, 2014, and 2016 compared to other
9 congressional elections in the country?

10 A Yes, I did.

11 Q And if we could look at page 5 of Exhibit 4003, does
12 Figure 2 illustrate that?

13 A Right, so here we focused on elections that have been
14 relatively close, decided by margins of 55 to 45, and now we're
15 down to 282 elections, and for each one of those 282 elections,
16 we get a partisan bias score; and, again, we're using this
17 graphical technique called a histogram to summarize
18 graphically, to let us see graphically the distribution of
19 those 282 numbers.

20 Q And can you tell us why you only looked at the 45 percent
21 to 55 percent elections?

22 A Yeah, and that's to do with the particular nature of
23 partisan bias. Remember, when I defined partisan bias, it's
24 this -- it asks us to imagine a 50/50 election. Well, that's a
25 stretch if the election was 60/40 or 65/35. So before you even

1 do it, why not make the counterfactual that partisan bias asks
2 us to contemplate. Let's put ourselves in a world where that's
3 not a huge stretch. So the universe of cases here I define
4 down at 55/45. So that's why our subset -- we've still got a
5 lot of data, 282 congressional elections decided by margins
6 like that.

7 Q And so what does the data -- your analysis of the data as
8 reflected in Figure 2 tell you about North Carolina's partisan
9 bias measures?

10 A Well, it's not a dissimilar conclusion to the histogram we
11 were looking at earlier of the efficiency gap scores. We see,
12 again, most of the data are close to zero in the sense that
13 that's where the histogram bars are taller, indicating there's
14 more data around zero and that we've got to go way out into the
15 left-hand tail. The unusual nature, if you will, the extreme
16 nature of the partisan bias estimates that we're getting out of
17 North Carolina '12, '14, '16, they're all the way over in the
18 very left-hand tail of the graph, and, indeed, they're that
19 last bar. Those three scores are largely almost exclusively
20 what's giving us any data at all that far out. It's what's
21 North Carolina has produced in the last three cycles. It's
22 over 44 years, 282 elections. North Carolina -- the last three
23 elections that North Carolina has produced are producing
24 partisan bias scores of quite literally historic magnitude, not
25 just relative to North Carolina's history, but in the United

1 States of America.

2 Q Now, did you also look at the mean-median difference
3 metric for partisan asymmetry?

4 A Yes, I did.

5 Q And is this reported on page 8 of your rebuttal report,
6 Exhibit 4003?

7 A Yes, that's the relevant part of the report.

8 Q And what does that show?

9 A That, too, shows that by this metric the North Carolina
10 plan is exhibiting quite unusual features, unusually large
11 pro-Republican advantage, as evidenced by this other measure.
12 The mean-median difference in 2016 is 5.1, and the way we
13 compute that is to note that across the 13 districts, average
14 Democratic vote share was 46.7, but the median was 41.6; and
15 the fact that the mean lies above the median indicates the skew
16 in the distribution, right, the -- for skewed distribution, the
17 mean will be pulled in the direction of the skew, and the skew
18 here arises from the fact that there are three districts where
19 Democratic vote share is in the 60s, and then there are ten
20 where it's below 50 percent, where the Democrat lost, and
21 that's what's giving us 5.1. That is a large number relative,
22 not only to the country where that roughly has a mean of zero,
23 but also to North Carolina's history. 1972 to 2016, that
24 mean-median difference is one, one percentage point. In 2016,
25 it was five times that. It's 5.1.

1 Q So we've looked at the efficiency gap metric, the partisan
2 bias metric, the mean-median difference. Do all of those
3 measures of partisan asymmetry lead to the same conclusion
4 about North Carolina's 2016 congressional districts?

5 A In my opinion, absolutely.

6 Q So then based on the historical analysis you performed in
7 this case, what did you conclude about the partisan asymmetry
8 of the 2016 Congressional Redistricting Plan?

9 A Well, to recapitulate, we have negative 19.4. That is the
10 efficiency gap score for North Carolina in 2016. That is
11 historically large. It is the largest we observed in 2016. It
12 is large relative to not just North Carolina's history, but the
13 history of efficiency gap scores 1972 to the present. It is so
14 large that I assess it is generating tangible consequences in
15 terms of seats being won by one side of politics relative to
16 the other. It is so large that it is in my view and based on
17 my analysis of efficiency gap scores and plans that it is not a
18 one-off. Negative 19.4 is not the result of chance factors.
19 It is a symptom of a structural feature of the plan, much more
20 so than it is the result of something unusual in the air in
21 2016. I'm quite convinced of that.

22 If left in place, the plan will continue to generate
23 efficiency gap scores comfortably above the threshold I
24 identified as where we would say it is more likely than not to
25 be associated with a seat going to one side of politics versus

1 the other.

2 MS. EARLS: I have no further questions, Your Honor.
3 If I may, if I haven't before, I would like to move for the
4 admission of the Demonstrative Exhibits 4078 and 4079 we used.

5 JUDGE OSTEN: All right. So admitted.
6 Cross-Examination?

7 MR. STRACH: Yes, Your Honor.

8 CROSS-EXAMINATION

9 BY MR. STRACH:

10 Q Good morning, Dr. Jackman.

11 A Good morning.

12 Q Phil Strach. We've not met. My colleague took your
13 deposition, but I'll have a few questions for you this morning.

14 Dr. Jackman, I assume it's -- you've never actually
15 participated in politics in terms of running a campaign or
16 doing anything like that, is that correct?

17 A Strictly speaking, no, no, no.

18 Q When you say "strictly speaking," what --

19 A I've done polling, not for candidates, but very, very up
20 close, shall we say.

21 Q Have you ever -- have you done any -- other than what
22 you've done on the efficiency gap, have you done any research
23 on the impact of fundraising and availability of money to
24 candidates in Congressional elections?

25 A No.

1 Q Have you done any research on the impact of political ads
2 in congressional races?

3 A No.

4 Q How about "Get out the vote" operations? Have you
5 researched how those operations affect the congressional
6 elections?

7 A Not in my refereed publications, no.

8 Q Have you ever studied the extent to which local issues, in
9 particular congressional districts, affect congressional
10 elections?

11 A No.

12 Q I assume you've never actually sat down and drawn, say, a
13 Congressional redistricting plan?

14 A No.

15 Q Have you done any of these simulations like we've seen
16 with some of the other experts?

17 A Simulated maps?

18 Q Yes.

19 A No, no, I have not.

20 Q You were mentioning -- and we'll talk a little bit about
21 this more. You were mentioning using the efficiency gap
22 prospectively. Have you actually ever done an efficiency gap
23 analysis on a plan before an election was held under it?

24 A No, I have not.

25 Q All of your research involves applying actual election

1 results to an actual plan generating the efficiency gap number,
2 correct?

3 A Yeah, all of my analysis used actual results, yes.

4 Q Are you aware whether any legislature anywhere in the
5 United States uses the efficiency gap currently to --

6 A I have no knowledge of that.

7 Q Do you happen to know whether any of the independent
8 commissions that exist for redistricting use efficiency gap?

9 A I'm unaware.

10 Q Other than what you've done in the efficiency gap arena or
11 what you've described broadly as partisan symmetry, what other
12 work have you done specifically in the redistricting context?

13 A Well, we were referring to some of my earlier work where
14 I've engaged in some of the analysis we were describing towards
15 the end of my testimony where we relate measures of partisan
16 asymmetry, in that case partisan bias, to partisan control of
17 the redistricting process.

18 Q Were those some of the articles that you wrote in the
19 '90s?

20 A Yes.

21 Q So between those articles and what you've done for this
22 case, have you done any research on redistricting in the
23 meantime?

24 A Again, nothing that has appeared in a refereed journal.

25 Q And that's about what, 20, 20-some years?

1 A Roughly.

2 Q All right. So let me just kind of drill down a little bit
3 on some of the actual efficiency gap calculations.

4 You have focused primarily here on states with seven
5 to fourteen congressional districts, correct?

6 A And but -- and above, but to make conclusions about North
7 Carolina, which has 13, yeah.

8 Q You don't focus on states with six or less congressional
9 seats?

10 A No, I do not.

11 Q So just so I understand the concept of the wasted votes,
12 if the candidate loses under your model, that means every
13 single vote that that candidate got is, quote, wasted in your
14 analysis, is that correct?

15 A Yeah, the definition of wasted votes asks -- is tied to
16 this idea that votes cast that do not yield seats in this very
17 narrow sense of that term are wasted.

18 Q All right. They're not actually wasted in fact, right?
19 The voters who cast those votes would probably not agree that
20 their vote was wasted in the normal sense of the term?

21 A It's important to acknowledge we're using the word in a
22 very technical sense.

23 Q And if the winning candidate in terms of their wasted
24 votes -- their wasted vote -- you've got -- if they get
25 50 percent plus one, the one vote is wasted on their side,

1 correct?

2 A If all they wanted was 50 percent plus one, they haven't
3 wasted any votes. They've done exactly what they needed to win
4 and nothing more.

5 Q So in a -- if you were in a very competitive congressional
6 district, isn't it the case that because of the way the concept
7 of wasted votes work, the wasted votes could easily flip from
8 year to year, depending on the outcome of the competitive
9 election?

10 A You want to walk me through an example?

11 Q Is it possible -- let's say you have a district that is,
12 as you've said, you know, 50/50, that the Republican wins one
13 year, a Democrat wins the next year. The number of wasted
14 votes for each is going to flip?

15 A Well, let's take the winning case. Suppose I win by one
16 vote, and next year two votes change hands or one vote changes
17 hands, and you win by one vote. Now, how many votes -- that's
18 the case where I go from having wasted only one vote to having
19 wasted a lot of my votes. So, sure.

20 Q All right. So the efficiency gap itself is based on a
21 statewide calculation of wasted votes versus seats won, isn't
22 that correct?

23 A Versus? I don't quite understand the last words in your
24 question.

25 Q You're using a statewide calculation of wasted votes

1 versus seats actually won?

2 A The efficiency gap is computed by doing those wasted-vote
3 calculations district by district and then summing over the
4 districts.

5 Q Right. And when you sum over the districts to get the
6 actual outcome, that's a statewide figure, correct?

7 A That's correct.

8 Q Have you done any calculations designed to determine
9 whether a particular district was intentionally gerrymandered
10 as relates to a prior particular district, or is this your
11 report relying on a statewide figure?

12 A No, I haven't. I've tended to focus on the fact that the
13 efficiency gap is, by design, a statewide, jurisdiction-wide
14 concept. It is nonetheless in relatively small jurisdictions
15 where you can literally eyeball the data. The packing and
16 cracking sometimes jumps off the page, as I tried to lead the
17 Court through this morning with that exhibit on the screen. So
18 it's helpful in that respect, but it is at root designed to be
19 a jurisdiction-wide or, if you will, a statewide entity -- or
20 quantity.

21 Q Right. Now, I think you mentioned that Professor McGhee
22 was the first person to discuss the notion of wasted votes in
23 this context.

24 A I would say that he was the first person to sort of build
25 the index that is today known as the efficiency gap. Wasted

1 votes, per se, had been talked about in this strictly kind of
2 technical sense in which we're using the word "wasted" and has
3 been around in the political science literature for some time.

4 Q All right. And then I think you said that the term was
5 actually coined in the article from McGhee and Professor
6 Stephanopoulos?

7 A The efficiency gap comes into the literature through that
8 article.

9 Q That particular nomenclature, efficiency gap, correct?

10 A That's correct.

11 Q And you're familiar with that particular article?

12 A I am.

13 Q If you could turn in the notebook that we have there for
14 you. Put up -- we are going to put up Exhibit 5064. It's
15 Defense Exhibit 5064 for identification purposes. It's behind
16 the first tab, Dr. Jackman. Do you see it?

17 A I've got it in front of me.

18 Q Do you recall this being a chart of efficiency gap scores
19 calculated by Professor Stephanopoulos in the article we were
20 just referencing?

21 A I will accept the representation that these are the
22 efficiency gap scores that went into the article.

23 Q All right. And the scores that you calculated are very
24 similar to Professor Stephanopoulos's scores for 2012, aren't
25 they?

1 A I believe so, yes.

2 Q Okay. Didn't you -- in terms of your numbers, your
3 efficiency gap numbers, and McGhee and Stephanopoulos, didn't
4 you both have a higher efficiency gap score for the 2011 North
5 Carolina Plan than the 2016 Plan?

6 A I can speak with authority to my estimates, and that is
7 the case. The difference I would, though, point out is
8 extremely small relative to the variation in efficiency gap
9 scores over the full 512 elections I looked at. We're talking
10 about .01, .02 at most.

11 Q All right. But your efficiency gap score for the 2011 map
12 was higher than the 2016 score, correct?

13 A The 2012 and 2014 under the 2011 Plan, that's correct,
14 but, again, I would point out that the differences we're
15 talking about are extremely small.

16 Q So given that, that means there would have been more
17 proportionately wasted Democratic votes under the 2011 Plan
18 than the 2016 Plan, correct?

19 A I believe so. That must be -- in proportional terms, yes.

20 Q Right. But in your -- the analysis that you conducted,
21 you didn't try to identify the residences of ticket-splitting
22 voters who might vote for candidates of either party, did you?

23 A Could you repeat the question? I didn't identify the --

24 Q The residences -- you didn't try to identify the potential
25 ticket-splitting voters who might vote for candidates of either

1 party?

2 A There's nothing in the computation of the efficiency gap
3 that requires I know anybody's address.

4 Q But you didn't try to identify in particular districts
5 groups of voters who might be ticket-splitters?

6 A No.

7 Q Now, is it true that in the Stephanopoulos and McGhee
8 article, that they concluded that the 2011 North Carolina Plan
9 would not be subject to review because of the efficiency gap
10 score?

11 A That's my recollection of that case. My recollection is
12 that they were using a different threshold to the one I
13 derived.

14 Q And isn't it also true, though, that part of the reason
15 why it was not actionable, so to speak, under the efficiency
16 gap in their article was because of plausible shifts in voting
17 behavior by ticket-splitting voters?

18 A I don't know why they -- I don't know why this fell below
19 their threshold.

20 Q All right.

21 A Or the -- you know, I don't. It was their analysis.

22 Q Do you agree that Stephanopoulos and McGhee in their
23 article agree that the Supreme Court has stated that some
24 partisan consideration in redistricting is lawful?

25 A You're asking me to opine over their opinion as to the

1 Supreme Court opinion. I just don't know.

2 Q I'm just asking you if you remember that's what they said
3 in their article?

4 A So could you repeat it?

5 Q Did Stephanopoulos and McGhee say in their article that
6 the Supreme Court has said that some partisan consideration in
7 redistricting is lawful?

8 A I don't recall that part of their article.

9 Q All right. Let me get to one of the differences between
10 your analysis and their analysis. Did McGhee and
11 Stephanopoulos in their efficiency gap work adopt a criteria
12 that the scrutiny would apply only if a party won two or more
13 seats than what would be predicted by the efficiency gap?

14 A That's my recollection of the threshold that they set in
15 their piece.

16 Q All right. And what's the threshold that you set?

17 A I looked for a threshold, with respect to the efficiency
18 gap, where historical record suggests that it is more likely
19 than not that one seat would -- we would have a one-seat
20 difference from a status quo.

21 Q Right. So in operation, didn't that require you looking
22 at, I think, .5 or .6?

23 A Of what?

24 Q Well, of a seat?

25 A Yes. That's the point at which it becomes more likely

1 that -- at .5, because it's halfway between zero and one,
2 that's the point at which it's more likely that a seat flips
3 than it doesn't.

4 Q Right. So under the Stephanopoulos and McGhee version,
5 instead of .6, it would take two seats -- the possibility of
6 two seats switching, correct?

7 A I'm confused by your reference to .6.

8 Q Well, .5. Theirs was 2; yours was .5, is that correct?

9 A Yes.

10 Q Why is yours so much lower than theirs?

11 A Because, again, as I just said, that is the point where on
12 a preponderance of the evidence, it's more likely, right, that
13 we're seeing a seat departure than no change at all.

14 Q Why do you think yours is more strict than the threshold
15 that they adopted in their article?

16 A I don't know. We arrived at our judgments independently.
17 If a plan -- when is a plan exhibiting manifest differently --
18 manifestly different consequences to the status quo or when is
19 it more likely than not that it is, that's the question I
20 thought was the appropriate one to ask, and that's the one I
21 set out to answer.

22 Q All right. So it's a judgment call on the part of the
23 researcher, such as yourself?

24 A We're at a stage where we are trying to set thresholds.
25 The very fact we are here and, indeed, the statement by Your

1 Honor at the very start of this matter yesterday morning
2 indicated that that is a live question, not just for the
3 research community, but for the bench, for the courts as well.

4 My analysis -- I tried to put myself thinking down
5 the road to today where we are asking ourselves at what point
6 can we use this metric to assess whether a plan should attract
7 judicial scrutiny. So I asked the question: When on the
8 preponderance of the evidence is it more likely than not that
9 this plan is generating manifest differences from the status
10 quo? I thought that was an entirely reasonable question to ask
11 and one I set out answering in the analysis provided in this
12 report and that I testified to earlier today.

13 Q All right. So the Court has two choices then, correct?
14 They've got the two -- the two seats swing from Stephanopoulos
15 and McGhee. They've got your .5 swing. What is the Court to
16 do -- how are they to choose between one or the other?

17 A With respect, that's for the Court. I've provided as best
18 an analysis of I can -- that I can of the -- given that
19 definition of what I thought where a plan might reasonably
20 attract judicial scrutiny. Courts could do nothing, too, by
21 the way; in which case, they've got a very easy decision, but
22 my job is to be helpful to the Court in making those
23 determinations.

24 Q All right. So let me make sure I understand another -- a
25 different -- another threshold -- another layer of this

1 threshold, and please correct me if I have stated this
2 incorrectly.

3 For plans with seven to fourteen seats, your analysis
4 requires an efficiency gap score of .08, and if it scores a
5 .08, that means the party in question is likely to elect at
6 least one more seat than expected?

7 A If you don't mind, I'll just turn to the relevant table in
8 my report, if that's okay, so I can make sure we're literally
9 on the same page here.

10 Q Please do it, and when you get there, would you tell us
11 which page.

12 A Yeah, I'm just taking myself back to -- in -- I'm now
13 doing this with respect to my notebook, not yours, but it's the
14 amended report, and so I believe we've tagged that 4002,
15 page 54, Table 3.

16 JUDGE BRITT: Page 54?

17 THE WITNESS: Yeah, page 54, sir, Table 3.

18 BY MR. STRACH:

19 Q Are you ready?

20 A Yeah. Could I get some water?

21 Q So for -- so for plans with seven to fourteen seats, your
22 analysis says that an efficiency gap score of at least .08
23 means that the party in question is likely to elect at least
24 one more seat than expected?

25 A It's more likely than not, that's right.

1 Q Okay. And you believe that congressional plans should be
2 subject to scrutiny in the first election under a new plan when
3 it's likely that one party will win at least one more seat than
4 expected over the life of the plan?

5 A That's what I anchored my analysis to, that presumption,
6 yes.

7 Q And let me introduce another number here to make sure I
8 understand how this fits in. You have said that an efficiency
9 gap of plus or minus .12 -- in the first election, you've set
10 that as a threshold to predict a congressional plan will likely
11 elect at least one more seat than expected over the life of the
12 plan?

13 A That's right.

14 Q All right. So to be actionable or subject to scrutiny by
15 the Court, after the first election, it needs a .12, is that
16 correct?

17 A In the case of seven to fourteen CD states, yeah.

18 Q Right. And then over the life of the plan, after -- if it
19 showed a .12 in the first election, that -- your prediction
20 then is it's going to then exhibit at least a .8 for the rest
21 of the plan, correct?

22 A The average EG over the life of the plan will be at least
23 a .08 magnitude.

24 Q Okay. All right. And so what do you do in the second
25 election? So if it's .12 in the first election, which triggers

1 some sort of scrutiny, but then it ends up being .04 in the
2 next election, what do you have to do? Do you have to wait for
3 the remaining elections before you know whether it should have
4 stayed actionable or not?

5 A Well, you identify exactly the dilemma I think everybody
6 finds themselves in. If we were to wait for the whole decade to
7 run out before we assess the plan, then, you know, it makes
8 what we're doing here kind of moot.

9 JUDGE OSTEN: Is there an answer to his question,
10 though?

11 THE WITNESS: Sorry. How about he restates the
12 question so I can answer it.

13 BY MR. STRACH:

14 Q So what are you to do? If there's a .12 in the first
15 election and there's a .04 in the next election, in order to
16 understand whether your -- the plan is subject to scrutiny
17 under your analysis, do you have to wait for one more election?
18 Two more elections? How many more elections?

19 A No, if you find yourself in this position that we're in
20 after two elections, then you could do a different -- you know,
21 I probably would have done a different sort of analysis. Given
22 what you see in the first two elections, what does that tell
23 you about the remainder of the plan? We could have done that
24 but didn't because that's not the case we find ourselves in
25 here.

1 Q All right. So your analysis is -- addresses the one
2 election under the 2016 Plan, but you've not provided the Court
3 what the answer will be if all of a sudden the efficiency gaps
4 drop in future elections. They would have to come up with
5 their own rule on that?

6 A I would be happy to come back and help you out in that
7 event.

8 Q I'm sure you would.

9 A I would say, though, that that would be surprising given
10 the historical record. A negative .194 of the sort we've got
11 now, the historical record suggests that for that to revert
12 back to something like a benign number below the .08 threshold
13 is extremely unlikely. I think it's important to stress that.

14 Q Well, life is full of surprises, isn't it?

15 A Yeah, and, indeed, American political history is full of
16 surprises, 1972 to 2016, and my analysis looked at all of them,
17 and the conclusion I just told you about. The unlikelihood of
18 a small efficiency gap score followed by the larger one we saw
19 here is informed by my analysis of not just this election or
20 the one before it, but of 512 of them and 136 plans, and that's
21 why I sit here and tell you I think that's very unlikely to
22 happen.

23 Q Right, but if it did happen, your analysis hasn't thought
24 through what a Court would have to do with that in that event,
25 has it?

1 A If we were back here after two elections under the plan, I
2 would be presenting evidence -- analysis of two versus the
3 remaining three.

4 Q So if that were to happen, you know, potentially, we could
5 have a court case every two years over a congressional plan,
6 couldn't we?

7 A I don't think there's much to stop people suing over plans
8 at any point of the cycle.

9 Q Well, we may have agreed on that. It may be one of the
10 few things we agree on.

11 Let me focus you on -- and this is something that you
12 talked about in your deposition, and if we need to pull your
13 deposition out, we'll look at it, but as I understand it, you
14 looked at -- some of the data you looked at was the elections
15 from -- or plans from 2000 to 2014 --

16 A Yeah.

17 Q -- that had a .12 in the first election, right? Is that
18 correct?

19 A Yep.

20 Q And you found that nine plans in that time period had a
21 .12 in the first election, correct?

22 A That's right.

23 Q And isn't it true that in three of those plans, the
24 efficiency gap average did not remain .08 for the remainder of
25 the decade, correct?

1 A That's correct.

2 Q And you referred to that, and that is what you would call
3 a, quote, false discovery, is that right?

4 A That's right.

5 Q And, in fact, you referred to it as an error rate, isn't
6 that right?

7 A We could call it that as well.

8 Q All right. So the standard that you've proposed, at least
9 in this instance, had an error rate of 33 percent, correct?

10 A On one side, right. It's making many other errors, by the
11 way, where it's not throwing a flag at a plan that it probably
12 should, right, where the errors here that this threshold that
13 I've proposed makes err on the side of keeping plans out of
14 court, and when it does throw a flag, it threw -- you know, 30
15 plans, it threw nine flags, three of those in retrospect
16 shouldn't have been thrown might be the way to help people
17 understand that; but there were many others where it should
18 have thrown a flag but didn't because we're erring on the side
19 of conservatism.

20 So if you want to talk about error rate here, that's
21 fine, but I think it's important for everybody to understand
22 it's errors with respect to where we threw a flag in the first
23 place, not errors where, for the sake of being conservative, we
24 didn't throw a flag.

25 Q So it's errors both ways?

1 A There are errors both ways; but, as I said, we're being
2 very careful to keep plans out of court unless we're extremely
3 confident that they're going to stay above that threshold.

4 It's also important to understand that in the case of
5 states with 15 or more CDs, we don't make any errors. There
6 were 14 plans like that since 2000. We throw eight flags, and
7 we go -- we go eight for eight where that was the right call to
8 make with respect to each of those eight plans that were
9 singled out for safer scrutiny.

10 Q Now, you've testified as well, I think as you mentioned,
11 in the case in Wisconsin, the *Whitford* case?

12 A I did.

13 Q Is it true that in the *Whitford* case your threshold for
14 the number of congressional districts there was eight to
15 fourteen, not seven to fourteen?

16 A That's my recollection, yes.

17 Q All right. And, yet, for purposes of this case here in
18 North Carolina, you've reduced your threshold where you believe
19 the efficiency gap can be calculated to seven seats, is that
20 correct?

21 A Yes.

22 Q By reducing the threshold to seven seats, does that sweep
23 in any state's plans to be actionable under your analysis?

24 A Oh, that's a good question. I know obviously we get more
25 states in the analysis that way. Whether -- I don't know the

1 answer to that question specifically, sir, I don't.

2 Q Yeah, and that's a good point, but it does subject
3 numerous other states to the analysis by reducing it from eight
4 to seven, correct?

5 A Not many. Just preparing for testimony, I went back -- in
6 anticipation of exactly this question, I went back and looked
7 at how many seven CD states we have. Alabama is such a state,
8 Arizona again sneaks in, but it doesn't make a particularly big
9 difference to the analysis or the conclusions.

10 Q It also sweeps in South Carolina?

11 A Yes, it does.

12 Q All right. Is it true -- back on the Wisconsin case,
13 *Whitford*. Is it true that you gave a report in that case
14 criticizing a report authored by Dr. Chen, who has testified in
15 this case?

16 A There may have been some language in there where I
17 addressed work by Dr. Chen.

18 Q And was the gist of your criticism of Dr. Chen that his
19 simulated maps, under some prior research he had conducted,
20 didn't account for the Voting Rights Act?

21 A I haven't read that for a while. If you are able to
22 direct me to that, I could verify that.

23 Q Look at the Tab 5056, and if you'll put up Defendants'
24 Exhibit 5066. It's marked Defendants' Exhibit 5056 for
25 identification purposes.

1 A 5056.

2 Q And we're going to go to page 21 -- page 20. And,
3 Dr. Jackman, if you'll look at the bottom of page 20, the word
4 "first," and if we can blow that up a little bit, if possible.
5 At the bottom of page 20 and carrying on to page 21, if you
6 could just read that -- the paragraph that starts "first,"
7 comma, if you could just read that paragraph to the Court.

8 A Sure. "First, Chen and Rodden do not even attempt to
9 simulate lawful plans. Rather, they simulate plans 'using only
10 traditional districting criteria of equal apportionment and
11 geographic contiguity and compactness.' They do not take into
12 account Section 2 of the Voting Rights Act, which often
13 requires majority-minority districts to be constructed. They
14 also do not take into account Section 5 of the VRA, which until
15 2013 meant that existing majority-minority districts could not
16 be eliminated in certain states, and they do not take into
17 account state-level criteria such as respect for political
18 subdivisions and respect for communities of interest, which
19 are, in effect, in a majority of states."

20 Q All right. So you did criticize Dr. Chen for some of his
21 research that didn't take into account the Voting Rights Act,
22 correct?

23 A Yes.

24 Q Now, in your own analysis for this case, did you do any --
25 did you compare plans before or after 1992 to determine the

1 number of African-Americans elected between 1970 and 1990
2 versus those elected in 1992 through 2014?

3 A I think I did that specifically. I did look at the
4 relationship between the efficiency gap and the proportion of
5 minority legislators in a given state's congressional
6 delegation.

7 Q Could you point out to me -- could you look at your report
8 and tell me --

9 A My report? Yep. Is my rebuttal report in your tabs?

10 Q Why don't you use the other binder. It's probably easier
11 that way. So you're looking at your rebuttal report?

12 A Yes, I am, sir. I'm looking at --

13 Q Could you tell us what number is on the front.

14 A Yeah, I'm sorry. So that's 4003, page 11.

15 Q All right. You did this in your rebuttal report, not in
16 your initial report?

17 A That's correct.

18 Q And did you do a comparison of efficiency gap scores from
19 1970 to 1990 to see if they differed in any material way from
20 the scores for 1992 through 2014?

21 A No, I did not. Oh, in aggregate or with respect to this
22 question?

23 Q Either.

24 A In aggregate, I did, yes.

25 Q And did you do that with respect to this question of the

1 Voting Rights Act or --

2 A No, and what I did not do is specifically relate any such
3 difference to VRA-type matters, no.

4 Q All right. And you did not identify or otherwise focus on
5 states that were formerly -- or that were covered by Section 5
6 of the Voting Rights Act, did you?

7 A Only in the indirect sense perhaps, as reflected in the
8 analysis in my rebuttal report.

9 Q All right. And did you do any comparison of the
10 efficiency gap scores for states covered by Section 5 versus
11 those not covered by Section 5?

12 A I have not broken the data along those lines specifically,
13 only in the indirect sense in which I pick up on that via the
14 analysis in the rebuttal report.

15 Q All right. So you don't know what effect Section 5
16 coverage may have had on efficiency gap scores over time, do
17 you?

18 A Strictly speaking, no.

19 Q All right. Now, in your analysis, your overall analysis,
20 you did not examine the quality of the incumbent in the
21 district or the challengers, did you?

22 A Not directly, other than to again come back to the point
23 that all that natural variation in the incumbency challenge
24 equality is, if you will, baked into the pie. The rich
25 tapestry of American politics 1972 to 2016 is in the analysis

1 and in the conclusions I draw from that analysis.

2 Q All right. But you didn't separately analyze incumbents
3 or challengers as part of your analysis?

4 A No, I didn't and didn't have to.

5 Q And you -- you've done other research or have read other
6 research. I believe you stated that you believe incumbency
7 worked at least three percentage points in an election?

8 A I think it's varied over the years.

9 Q It's very what?

10 A I think it's varied over the years.

11 Q All right. Have you read literature that led you to
12 believe that 3 percent was a fair percent to put on that?

13 A In recent years, that's getting around -- that's -- put it
14 this way. That would be close to the scholarly consensus for
15 recent decades. It's come down a lot from where it used to be.
16 So 3 percent would be not -- not an unreasonable judgment.

17 Q All right. And you didn't separately consider how
18 fundraising or the amount of money raised by candidates
19 affected the efficiency gap separately?

20 A I did not isolate the independent effects of that other
21 than to say it's baked in that pie I was referring to earlier.

22 Q Right. Okay. And where there were uncontested elections,
23 you had to develop an imputation method to deal with that,
24 correct?

25 A Yes, I did.

1 Q And your efficiency gap analysis does not account for
2 turnout and how that might vary between elections in
3 congressional districts, does it?

4 A Could you say a little more what you're referring to
5 there?

6 Q Well, you count up the votes that were actually tallied,
7 correct, as part of your analysis, and then you apply your
8 formula to the --

9 A We are not talking about the imputation method now. We're
10 -- okay --

11 Q Yeah, sorry, we're talking about the efficiency gap
12 itself.

13 A Okay.

14 Q You tally up the votes, and you apply your formula to
15 them, correct?

16 A Yes.

17 Q All right. But you don't step back and analyze why the
18 turnout was what it was to produce those numbers, do you?

19 A No.

20 Q You just take the numbers as they are?

21 A I do.

22 Q Having looked at a lot of congressional elections and a
23 lot of redistricting maps -- I'll tell you what. Let's just
24 put it on the screen. I'm just going to ask for exhibit --
25 Defense Exhibit 5012. It's going to go up on the screen. This

1 is the 1992 Congressional Plan.

2 A Okay.

3 Q I think most folks in here will be familiar, but I want --

4 JUDGE OSTEEEN: I'll tell you what. Before you do
5 that, let's take a lunch recess until 1:45.

6 (At 12:25 p.m., break taken.)

7 (At 1:46 p.m., break concluded.)

8 JUDGE OSTEEEN: You may continue, Mr. Strach.

9 MR. STRACH: Thank you, Your Honor.

10 BY MR. STRACH:

11 Q All right. Dr. Jackman, before we broke, I think we were
12 going to take a look at exhibit -- what's been marked for
13 identification purposes Defendants' Exhibit 5012 and this is
14 the 1992 North Carolina Congressional Plan. Dr. Jackman, have
15 you ever seen that plan before in your study of these
16 congressional elections, et cetera?

17 A It's one of the plans -- the plan that was in place '92
18 onwards was -- does appear in my analysis.

19 Q Right. And as we mentioned before -- and you'll recall
20 this is the plan -- the Congressional Plan that's somewhat
21 infamous for the 12th Congressional District. Do you agree
22 with me about that, the snakelike district?

23 A Okay.

24 Q Do you see that?

25 A I do see the --

1 Q It looks a lot like a snake, right?

2 A Okay.

3 Q So it comes down in Gaston County and kind of snakes its
4 way all the up through Durham County. Do you see that
5 district?

6 A Yes.

7 Q Would you consider that to be a gerrymandered district?

8 A I don't have a view on whether a district is
9 gerrymandered.

10 Q Okay. All right. Even just kind of looking at it, you're
11 not willing to say that's a gerrymandered district?

12 A I've done analysis of entire plans using measures of
13 asymmetry that are properties of the plans -- the plans. My
14 approach is based on that rather than eyeballing maps.

15 Q Okay. So under this 1992 Plan under -- the way you
16 analyze efficiency gap, scrutiny would not be required if the
17 first election under this plan was under .12, correct?

18 A That's correct.

19 Q And isn't it true that in your calculations this
20 particular plan scored below .12 in the first election after it
21 was drawn?

22 A Our estimate -- yes is the answer to your question.

23 Q You do recall that, correct?

24 A Yes.

25 Q This plan -- this 1992 Congressional Plan with that 12th

1 District, that first district, would not have warranted
2 constitutional scrutiny under your calculation of the
3 efficiency gap, is that correct?

4 A That's correct.

5 Q Now, when you are determining whether a plan should be
6 subjected to scrutiny, you do not particularly look at how many
7 counties are divided in any given map, do you?

8 A No, I do not.

9 Q And so you would have -- unless you counted them up, you
10 have no idea how many counties were divided in this 1992 Plan?

11 A I couldn't tell you, no.

12 Q All right. And when you are assessing whether a plan
13 should be subject to scrutiny, you don't look at whether
14 precincts or voting-tabulation districts are divided, do you?

15 A No, I do not.

16 Q So you wouldn't know, unless you counted them up sitting
17 here today, how many divided precincts were in the '92 Plan, do
18 you?

19 A I couldn't tell you that, no.

20 Q Did you ever by chance read the legal cases --

21 A No, I did not.

22 Q -- that the 12th District spawned? No. Okay. Does a
23 case called *Shaw v. Hunt* ring a bell to you?

24 A No, it does not.

25 Q And so we've talked about county splits and VTD splits.

1 Isn't it true in general in your analysis you don't evaluate
2 how well a plan complies or doesn't comply with traditional
3 redistricting principles, do you?

4 A No. You saw, for instance, the calculation we performed
5 for North Carolina '16. To the extent -- 2016. To the extent
6 a plan may not comply with conventional redistricting criteria,
7 that may and probably will give rise to large values of wasted
8 votes, but directly no.

9 Q And would you -- when I say -- when I use the term
10 "traditional redistricting principles," do you understand that
11 to mean things like splitting counties, precincts, et cetera?

12 A Well, equal population, contiguity, compactness,
13 minimizing splits, preserving communities of interest.

14 Q Right. And I mean would you agree with me that just
15 visually looking at the 1992 Plan that that plan does not do a
16 very good job of complying with traditional redistricting
17 principles?

18 A It's the first time I've seen it all. I don't have an
19 opinion on that.

20 Q Okay. Now, you don't -- in your analysis, you don't
21 attempt to isolate the effect of county splits on the
22 efficiency gap calculations, do you?

23 A Not on a plan-by-plan basis, no.

24 Q And you don't attempt to isolate the effect of precinct
25 splits on your EG calculations, do you?

1 A No, I do not.

2 Q And your analysis does not attempt to isolate the
3 residential concentrations of Republican or Democratic voters
4 around the state, does it?

5 A No.

6 Q And you don't attempt to analyze how residential patterns
7 or residential locations of Republican or Democratic voters
8 would impact the efficiency gap scores for a particular plan,
9 do you?

10 A Again, not in a direct way, but only to again assert that
11 fluctuations in residence patterns, political geography over
12 time and over the American states are reflected in the
13 historical analysis and the conclusions I draw from historical
14 analysis.

15 Q All right. And is it also the case that because this 1992
16 Plan under your analysis would not have triggered
17 constitutional scrutiny that under the analysis you're
18 proposing none of those districts -- individual districts would
19 be subject to scrutiny either? Is that correct?

20 A I'm not qualified to answer that question. Whether there
21 may be legal grounds for challenging a particular district
22 is -- I'm not qualified to offer an opinion on that.

23 Q Okay. Well, let me ask it to you this way. Let's assume
24 that the initial election under a plan draws an efficiency gap
25 of less than .2 under a given plan.

1 A Less than .2?

2 Q .12. Excuse me.

3 A .12.

4 Q Are you offering the Court any analysis or test of how it
5 could nonetheless identify individual district gerrymanders
6 even where the overall plan doesn't trigger scrutiny?

7 A That was not what I was asked to -- that analysis was not
8 what I was asked to provide in this matter.

9 Q All right. I'm going to ask you to take a look on the
10 screen at what's been marked Defendants' Exhibit 5061 and this
11 is -- I'm sorry. Exhibit -- what's been marked as Defendants'
12 Exhibit 5044. And, Dr. Jackman, I hope that it appears better
13 on the screen to you and maybe if you look at the screen on
14 your witness stand. Are you familiar with the revised version
15 of the North Carolina Congressional Plan in the '90s after the
16 '92 Plan was struck down?

17 A No.

18 Q You understand, though, that the Congressional Plan in the
19 '90s in North Carolina did change, correct?

20 A I believe I picked that up in --

21 Q It had the orange dots on it.

22 A Yes.

23 Q Page 21 of your amended report.

24 A Yep. Here we go, yep.

25 Q All right. And are you able on your screen to see the

1 12th District?

2 A Yes.

3 Q And is it fair to say that it's not quite as snakelike,
4 but it's still a snakelike district?

5 A To be honest, I can see it much more clearly on this map
6 than I could on the previous one and what I believe to be 12 on
7 this map is not snakelike.

8 Q Okay. Now, this particular plan under your calculations
9 would also not be subject to scrutiny, is that correct?

10 A I would have to just find the relevant part of my report
11 where I have those --

12 Q All right. Let's look in your amended report at page 63.
13 I think that's the relevant figure.

14 A Yes. Correct, yep.

15 Q So this particular plan would also have not been subjected
16 to scrutiny, is that correct?

17 A Yeah, the first election -- this is in place as far as
18 1998, so no.

19 Q You said you hadn't read the *Shaw v. Hunt* case. Are you
20 familiar at all with a case called *Cromartie versus Hunt* from
21 North Carolina?

22 A Nope.

23 Q Were you aware that at some point the State of North
24 Carolina defended the 12th District in this map as a political
25 gerrymander? Are you just generally aware of that?

1 A I was not aware of that.

2 Q Were you ever aware of a decision by the General Assembly
3 in the '90s to draw a congressional redistricting plan that had
4 six Republicans and six Democrats?

5 A No, I was not.

6 Q Is it -- would one way to avoid an efficiency gap issue
7 under your analysis be, if you had 12 congressional districts,
8 to draw six uncompetitive districts for Republicans and six
9 uncompetitive districts for Democrats?

10 A Not necessarily, no.

11 Q You don't agree with that?

12 A No. It would depend on -- if we were in a state that was
13 80/20, a 6-6 split of the seats would -- wouldn't seem
14 reasonable.

15 MR. STRACH: Your Honor, I'm going to hand up the
16 deposition transcript and use that at this time.

17 JUDGE OSTEN: All right.

18 JUDGE BRITT: What page have you directed us to?

19 MR. STRACH: I haven't yet, Your Honor.

20 BY MR. STRACH:

21 Q Dr. Jackman, if you could direct yourself to page 129.

22 A Yes.

23 Q And if you'll look beginning at line 5 -- if you'll read
24 to yourself lines 5 through 19 and let me know when you're
25 ready.

1 A "Question: Okay. All right. And then" --

2 JUDGE OSTEEEN: Read it out loud?

3 BY MR. STRACH:

4 Q Just you read to yourself --

5 A Oh, pardon me.

6 Q -- and then I'll ask questions.

7 A Okay. Five through 19?

8 Q Yes, sir.

9 A Yeah.

10 (Pause in the proceedings.)

11 JUDGE OSTEEEN: I think he's finished.

12 BY MR. STRACH:

13 Q So, Dr. Jackman, could you draw a plan that complied with
14 the efficiency gap by drawing six very safe Republican
15 districts and six very safe Democratic districts?

16 A Well, in the specific context of a state that was close to
17 being 50/50, yes, that would produce close to a zero efficiency
18 gap, but that's not what I heard you ask me before.

19 Q All right. So tell me specifically when I asked this
20 question that I'm asking you now, not --

21 A Okay. I'll listen very carefully.

22 Q Could you draw a plan that complied with the efficiency
23 gap by drawing six very safe Republican districts and six very
24 safe Democratic districts?

25 A The answer is it depends on the statewide balance of

1 Democrats and Republicans.

2 Q All right. So there are circumstances where that could be
3 true, correct?

4 A There do exist circumstances where, yes, 6-6 even on a
5 comparative could be -- could generate a small efficiency gap.

6 Q And if the State chose to comply with the efficiency gap
7 under the circumstances that would allow them to do it because
8 of the nature of how the math would work out, the State could
9 thereby entrench six Republicans and entrench six Democrats
10 into its congressional delegation, couldn't it?

11 A I suppose so, yeah.

12 Q All right. If you'll turn your attention to the screen,
13 we're going to put up what's been marked as Defendants'
14 Exhibit 5046. I will represent to you, Dr. Jackman, that this
15 is North Carolina's 2001 -- it was passed in 2001 --
16 redistricting plan for Congress. Have you ever looked at or
17 seen this particular plan?

18 A If I have, it hasn't been for a while.

19 Q Okay. Do you -- can you see on your screen where the 12th
20 congressional District is on the map?

21 A Yes. Yes. This is rather famous.

22 Q Right. This district has been famous for a long time,
23 hasn't it?

24 A Yes.

25 Q And it remained famous after this drawing of it, is that

1 correct?

2 A That's my recollection.

3 Q Okay. And you also see on this particular map District 13
4 in the northern part of the state?

5 A Yes, I do.

6 Q You see how it stretches from Wake County all the way over
7 to I think it's Guilford County?

8 A Thirteen up at the top?

9 Q Right.

10 A I think the leftmost county there is Rockingham, but yes.

11 Q Do you know anything about -- in 2002, after this map went
12 and had its first election, do you know who any of the
13 incumbents were in any of these districts?

14 A No.

15 Q All right. Isn't it true that this particular map would
16 not have been subjected to review under your analysis?

17 A That's correct.

18 Q However, is it not also true that by 2010 this particular
19 map scored above a .12?

20 A Yeah. In the very last election held under that map in
21 2010, there's a large value -- relatively large value of the
22 efficiency gap in a pro-Democratic direction of .13 or 4 or so,
23 yeah.

24 Q Would you agree with me that 2010 was generally what you
25 might consider a wave Republican year?

1 A That's my recollection.

2 Q And is that likely the explanation for why the efficiency
3 gap changed so much in 2010?

4 A Could be, but I'm not going to offer an opinion on that.

5 Q Okay. But if that wave election had occurred earlier in
6 the decade, it would have triggered scrutiny under your
7 analysis, correct?

8 A Accepting your premise about the connection between a wave
9 election and the big efficiency gap number, which -- okay.
10 Let's just do that, but I -- perhaps.

11 Q So this is an example where it wasn't known that this was
12 a potential gerrymander until the very last election of the
13 decade?

14 A I haven't done this with respect to exactly this plan, but
15 I wonder if some of the analysis of the sort I've been
16 recommending and demonstrated with respect to the North
17 Carolina -- the current North Carolina plan might have revealed
18 that had a large wave election come along that this plan would
19 be revealed to be an incumbent protection plan, so racking up a
20 big efficiency gap for Democrats, say. That is to say, the
21 reasoned analysis we might have done earlier that might have
22 forecast that this might be a property of the plan even though
23 it's only the trigger for scrutiny.

24 Q What analysis are you speaking about?

25 A The uniform swing analysis. There exists a set of

1 circumstances such that this plan might trigger a large
2 efficiency gap even though it isn't doing so now.

3 Q But you're saying you would have to do some uniform swing
4 analysis to figure that out?

5 A Well, yeah, yeah. You might -- it's a difficult problem
6 how might one reasonably anticipate something that no one saw
7 coming in, you know, five -- but there are tools available that
8 would at least put some weight on that possibility.

9 Q So the simple mathematical calculation of the efficiency
10 gap by itself won't do that, though, correct?

11 A No, no.

12 Q Now, speaking of uniform swing, that was a concept that
13 you talked about earlier. Is it fair to say, though, that this
14 concept of uniform swing has been criticized by other political
15 scientists?

16 A Yeah.

17 Q All right. So is it fair to say there's not a consensus
18 on the appropriate use of uniform swing in this context?

19 A I think that debate inside political science, one I've
20 contributed to over my career, has actually settled down
21 somewhat in recent decades precisely because it's a better
22 approximation to American political reality today than it may
23 have been earlier.

24 As electoral politics has become (a) more
25 nationalized and (b) more partisan, uniform swing -- and,

1 indeed, that's the point of my most recent publication "A30" on
2 my vitae, is to point to the sort of renewed validity of
3 uniform swing as a forecasting tool in recent American
4 elections, say if we were to go back to the '60s, '70s or even
5 the '80s; but I think in the '00s and forward political science
6 is discovering that uniform swing is not as bad as we might
7 have thought it was in those earlier decades.

8 Q But it's fair to say, right, the debate is not over?

9 A It's certainly calmed down an awful lot from where it was
10 in the '80s and the '90s.

11 Q All right. But there is a debate that's still going on
12 over uniform --

13 A Frankly, I would not characterize it as an active debate,
14 but a debate that people remember when they do their work and
15 keep in the back of their minds.

16 Q It's fair to say there is not a consensus?

17 A I think operationally there is, that most people doing
18 this sort of work see very little utility from assuming
19 anything other than uniform swing because it has become a very
20 good approximation over recent decades.

21 Q So are you --

22 A For instance, the last time I can recall a serious
23 critique of uniform swing in the literature that speaks to this
24 sort of work would be the wave of work around Gelman and King
25 in the '90s into the '00s that provided a lot of the work that

1 went up in the LULAC matter and I think two things happened.
2 One, LULAC didn't prevail; and, two, I think the world has
3 changed a little bit since then as well. And political
4 scientists know it's not 100 percent right, but it's a very
5 good approximation to contemporary patterns of change in
6 American politics and that is no longer an active debate is how
7 I would characterize the state of the field at the moment.

8 Q So let me just ask you again to make sure I get an answer
9 to the question. Are you willing to say that there is a
10 consensus?

11 A I would characterize the consensus as follows: In
12 American political science at the moment, most political
13 scientists are of the view that uniform swing is a very good
14 approximation to how election results change year to year,
15 cycle to cycle.

16 Q And the consensus is that it is just an approximation,
17 correct?

18 A A very good approximation.

19 Q And isn't it true, just as a matter of fact, that the
20 swing among districts is not uniform, in fact, 100 percent of
21 the time?

22 A No, but it's a very good approximation.

23 MR. STRACH: If you'll just indulge me, Your Honor,
24 as I look back through some notes.

25 (Pause in the proceedings.)

1 BY MR. STRACH:

2 Q Dr. Jackman, just to make sure this is clear, your
3 analysis is not designed to apply to states with six or fewer
4 congressional districts, correct?

5 A That's correct.

6 Q So the analysis that you're presenting to this Court could
7 not be used nationwide?

8 A It applies to 82 percent of the Congress.

9 Q Right. But not 100 percent?

10 A Not 100 percent.

11 Q So there would be some states -- there would be some
12 people living in some states who would not be subjected to this
13 political gerrymandering test under your analysis, correct?

14 A That's correct.

15 Q Now, you've described today -- and, again, make sure you
16 correct me if I'm wrong -- several measures of what I think you
17 would call globally partisan symmetry, right?

18 A Yes.

19 Q And you've got partisan bias. I think you've had the
20 mean-median difference and the efficiency gap, is that correct?

21 A That is correct.

22 Q And have you given any opinion in this case regarding how
23 -- is the Court supposed to apply all three of them at the same
24 time? Is the Court supposed to average them up? Is there some
25 priority? I don't want to know what the answer is. First I

1 want to know have you answered that in your report?

2 A My view is that the -- and, you know, I did not offer --
3 my report, for instance, I think is quite clear on this in the
4 sense that it's with respect to the efficiency gap that I did
5 the deep dive in trying to do the thresholds and the
6 durability. I look on these other measures of partisan
7 asymmetry, if you will, as strengthening the argument. In the
8 literature, other scholars rely on them. They give essentially
9 the same message as the efficiency gap, which is reassuring,
10 and that's particularly the case when our attention shifts to
11 North Carolina. But in terms of putting forward something for
12 future scholars and courts to hang their hat on, it's the
13 efficiency gap is where I've landed.

14 Q All right. And so far as your report is concerned and
15 your testimony to the Court, as you put it, the efficiency gap
16 is, quote, where you landed, correct?

17 A Correct.

18 Q Just a few questions about a concept that you raised of --
19 you did some imputation to account for uncontested elections,
20 is that correct?

21 A Correct.

22 Q And I think you said that of the -- in your data, I think
23 you said 518 out of 8,000 elections were uncontested, is that
24 right?

25 A 14 percent, yeah.

1 Q And what would you do -- how would you deal with the
2 efficiency gap analysis if in, let's say -- let's say the
3 legislature passes a plan in 2021 that's used in 2022; and of
4 the 13 districts that are up, three of them are uncontested.
5 How would your efficiency gap deal with that?

6 A So -- right. We're in 2021. Let's see. We're going to
7 have a presidential election in 2020. Is this -- we're doing
8 this analysis after that first election?

9 Q Yes.

10 A After the 20 --

11 Q 2022.

12 A 2022. All right. So we've seen the first election under
13 a new plan. We've got the 2020 election in our pocket -- the
14 presidential election in our pocket. One thing -- you know,
15 literally this is what I did in my report is look at the
16 relationship -- in the ten districts where we do have both 2020
17 presidential by district and a congressional result, plus
18 incumbency, we know what the relationship looks like between
19 presidential vote in the district and congressional vote in the
20 district, and we know we've got a rough handle from North
21 Carolina and from other districts around the country what the
22 incumbency advantage is.

23 That gives us then a basis since we've got 2020
24 presidential in the districts where we did not -- in the three
25 districts where we did not see a congressional contest, we've

1 got a basis there to -- you know, something to plug into our
2 model that's going to give us a predicted congressional vote
3 for the three ones where we haven't got it.

4 Q So you would be making an inference about what the vote
5 would have been had there been a contested election?

6 A Yeah. The last thing I would say about that is the way I
7 did the imputations is to also insist that whatever you predict
8 for the congressional vote in that district where the
9 congressperson did not have a challenger -- your inference is
10 that had that congressperson faced a challenge they would have
11 nonetheless won, so any imputation you make has to be above
12 50 percent of the two-party vote for the incumbent who did not
13 face a challenge, yeah.

14 Q All right. Would it cause any statistical validity issues
15 for you if 3 out of the 13 districts, though, were uncontested
16 and you had to make this inference about who would have won?

17 A It is not a validity issue. The issue that -- it does
18 raise an issue, but validity is not the issue.

19 Q What issue does it raise?

20 A Reliability. And now the honest thing to do and the thing
21 I did throughout the report -- anytime I'm in that situation,
22 we have to confront the fact that we have imputed data and we
23 don't impute exactly. We shouldn't pretend to know what would
24 have happened in that district with absolute certainty.

25 I employ methods to make sure that if I'm in a -- "3

1 out of 13 are imputed" situation, the efficiency gap I compute
2 in that election is going to be accompanied with some
3 uncertainty; and one of the things I was very careful to do is
4 to make sure that in the 512 elections -- if any of those
5 elections had some imputed data in it, then any inference I
6 make, say, about the relationship between the first election's
7 efficiency gap and the lifetime average efficiency gap has
8 folded in the fact that we don't know for sure what the
9 efficiency gap was because there was some uncontested data,
10 uncontested elections in there where we imputed and we never --
11 in statistics, we don't impute exactly. We impute off a model.
12 Models aren't perfect, but that's okay as long as everything we
13 conclude from that point forward carries that uncertainty
14 forward.

15 And you can make a statement about probabilities now,
16 hence that 99 percent probability number I reported earlier at
17 various points in my report and in my testimony. Every time
18 I'm doing that it's taking into account the fact that
19 14 percent of the data -- we had to fit a model to put a number
20 in there for a given congressional election where it was
21 uncontested.

22 Q Thank you. I appreciate that. Let me think about it this
23 way. Your overall efficiency gap analysis deals with the fact
24 that there's 518 out of 8,000 uncontested elections in your
25 data set, correct?

1 A Correct.

2 Q All right. So you've presumably dealt with that in some
3 way. What I'm trying to get at more is what if you have -- in
4 a congressional plan that has, say, 13 districts and you're
5 doing an efficiency gap analysis of that and you've got --
6 let's just say four out of the 13, a third of the districts,
7 had uncontested elections, does that present a reliability
8 issue for you?

9 A Oh, I get your question now. You would -- your estimate
10 of the efficiency gap would come out equipped with a 95 percent
11 confidence bound so --

12 Q If there were four out of 13?

13 A If there were one out of 13, right, because you've imputed
14 one. Only 13 out of 13 we know exactly what it is. It's just
15 a straight-shot calculation in North Carolina 2016, right?
16 Suppose even one, right? At that point we're imputing and one
17 of -- now, that wouldn't matter too much, right? If it was
18 only one district, the overall statewide quantity, the
19 efficiency gap won't be too troubled, but it will have a little
20 bit of uncertainty associated with it reflecting the fact that
21 one out of the 13 data points going into it was imputed. Now
22 you're asking me to think about two, now three, now four, and I
23 get it.

24 The point is, yes, your conclusion about the value of
25 the efficiency gap is starting to become a little more

1 uncertain, and I think it is an empirical question. It would
2 be a case-by-case determination. If you're at a point where,
3 you know -- let's make up a number -- 10 out of 13 are imputed,
4 I think that you would be in a world where it would be very
5 hard to say much about using this analysis, about the
6 efficiency that would be starting to come out.

7 And I would have to see for myself, but the
8 confidence bound on it would start to become large and
9 probably -- it might be a case where your point estimate lies
10 above the threshold, but the confidence bound that it's
11 equipped with, because you've imputed so much of the data,
12 pushes you back below the threshold. And then I think we've
13 got a real question, have we crossed the threshold or not; and
14 the answer is probably maybe not enough to trigger scrutiny
15 would be I think a perfectly reasonable response to analysis
16 under those circumstances.

17 Q I take it, though, this is not something you thought about
18 before today?

19 A No, I have because, as I just said, all through the report
20 there are examples where -- in coming up with the thresholds
21 themselves, I had to deal with that and so I'm very alert to
22 that.

23 The only thing I guess I would say is that it would
24 be -- you do get these cases here and there in the data where
25 you get a very large estimate of the efficiency gap. You go,

1 wow, that's a big number, but it's also got a big confidence
2 interval. That's reasonably rare and, indeed, more typical --
3 a few things to say: Uncontestedness is still around in
4 American politics at the national level, in Congress to be
5 sure. It has not going away. Massachusetts still racks up
6 considerably high levels of uncontestedness in its
7 congressional elections, for instance. But it's not as
8 prevalent as it used to be, number one.

9 And number two, when we tend to get a very large --
10 in the more recent decades, very large values of the efficiency
11 gap that are sailing above these thresholds that I've talked
12 about today, even in the presence of uncontestedness we're not
13 being troubled by especially wide confidence intervals that are
14 we really above the threshold or not. That's seldom, as a
15 practical matter, something I've seen in the recent data, but
16 it's a live question to be sure.

17 Q So, for instance, going back to the -- what we talked
18 about earlier, if the legislature had 12 congressional
19 districts and said, "All right. The heck with this. We're
20 going to draw six solid Republican districts, six solid
21 Democratic districts. We're just going to deal with the
22 efficiency gap that way," and let's say the math works out that
23 they -- that they pass with flying colors, isn't it likely that
24 in such a map you're likely to have a lot of uncontested
25 elections?

1 A Yes, I could easily imagine -- that's a -- well, I don't
2 know, but I see where you're going with the scenario.

3 Q And if that were the case and you had 10 out of 12
4 uncontested elections, wouldn't you have some serious
5 reliability issues to contend with going forward?

6 A It would be -- we're in a position in that case where,
7 since the election is not producing a lot of data, we would be
8 looking I think at this exercise of computing -- you know,
9 finding other ways to characterize the plan.

10 Q So in that situation, your efficiency gap would have
11 essentially killed itself off?

12 A Well, it's a rather speculative hypothetical chain that
13 you've put before me. Map drawers, in anticipation of scrutiny
14 from the efficiency gap, engage in this plan to get around it
15 and I wonder about the set of partisan redistricting -- you
16 know, what set of redistricters conspire to go 6-6 each way.

17 Q And just to be clear, you were talking about the
18 prospective use of the efficiency gap. I think I've asked
19 this, but just for the record, you've not actually done a
20 prospective use of the efficiency gap in this report in this
21 case, correct?

22 A No, I have not.

23 MR. STRACH: Your Honor, that's all I have at this
24 time.

25 JUDGE OSTEEEN: Redirect?

1 MS. EARLS: Thank you, Your Honor.

2 REDIRECT EXAMINATION

3 BY MS. EARLS:

4 Q I want to start with this 6-6 plan concept and -- first,
5 to be clear, as you explained the concept of the efficiency gap
6 based on wasted votes, this is not a measure that is intended
7 to lead towards -- necessarily lead towards competitive
8 districts, is that right?

9 A No. We're measuring symmetry and we can be symmetric in
10 many different ways.

11 Q So is it true in a 6-6 plan with a low efficiency gap that
12 means that we're treating the parties the same because it's a
13 low efficiency gap?

14 A That's the concept of symmetry, yes.

15 Q And would this kind of plan necessarily maintain a low
16 efficiency gap if the statewide vote shifted one way or the
17 other over the course of a decade?

18 A Well, if they're all uncompetitive districts, yes, right?
19 Those incumbents are quite immune from changes in the national
20 tide, if you will.

21 Q Now, my next -- I want to turn to the questions that you
22 were asked -- first let's -- clarify for us. We've used this
23 word "threshold" a lot. What figure or what threshold are you
24 recommending for flagging a redistricting plan as requiring
25 further attention?

1 A In states with relatively small congressional delegation,
2 7 to 14 seats, plus or minus .12; in states with larger
3 congressional delegations, plus or minus .075.

4 Q And then just because a plan is flagged, what's the next
5 step that needs to happen to determine whether it's ultimately
6 unfair?

7 A You've got to subject the plan to some of that uniform
8 swing analysis that I showed earlier to reassure yourself that
9 before you take the plan into court that under some modest
10 assumptions about the swings that are likely to come down the
11 pipeline through national tides that a small perturbation, say
12 something as little as 1, 2, 3 or even 4 percent, isn't going
13 to produce an efficiency gap that would knock us below the
14 threshold I just described.

15 Q So in other words, crossing the threshold isn't enough.
16 You then have to do the sensitivity analysis to determine
17 whether swings in the vote would keep you above the threshold.

18 A I think that's an especially wise thing to do given -- as
19 I was saying earlier, I did it in my report, but (b) uniform
20 swing is a pretty good approximation to what happens in
21 American elections.

22 Q Now, you were asked about an article by Stephanopoulos and
23 McGhee which used a different threshold. My question for you
24 is: Is there a principled reason to choose one threshold over
25 the other?

1 A Yes, yes. I believe that the Stephanopoulos and McGhee
2 threshold did not -- was not derived during the careful
3 examination of durability of efficiency gaps that I did, for
4 one thing; and that's, I think, you know, my reason for
5 preferring the way I've gone about this analysis, deliberately
6 trying to put myself in the shoes of a body trying to determine
7 the constitutionality or taking steps towards deciding the
8 constitutionality of a plan early in its life.

9 Q Now, you were also asked about a hypothetical situation
10 where in the first election after a new plan is implemented the
11 efficiency gap is .12, but then it becomes .04 in the next
12 election. How would a sensitivity analysis after that first
13 .12 election operate in these circumstances?

14 A Yes. So that sequence would be -- the plausibility of
15 that sequence would be revealed through the sensitivity
16 analysis of the first election's results. It would make clear
17 that the .12 might not be as robust as it may appear on its
18 face and that would be a very easy thing to determine, that
19 this is a .12 that is perhaps more fragile than it appears.

20 Q Now, you were also asked about your testimony in the
21 *Whitford* case or report, and initially you looked at eight and
22 above, and here you've gone to seven and above. Why did you
23 make that change?

24 A After I looked at the data very carefully -- and this is
25 my -- when I wrote that with respect -- in the *Whitford* matter,

1 I was looking at the fact that that was the state of the
2 literature. When I turned to it myself, I was of the view that
3 there were some states that ought to come into the analysis
4 with seven CDs that, frankly, we want to have in the analysis.
5 The more you can put in, frankly, the better. It makes the
6 case -- the analysis more compelling and more robust, and it
7 allowed us to put into the analysis -- you know, there's states
8 like Alabama and South Carolina and Arizona coming for part of
9 the period and, frankly, that's helpful.

10 I think we want to, where possible, subject what we
11 think we're learning to a more -- to a bigger pool, have more
12 data in the pool; and going from eight to seven struck me as a
13 step we could take. I don't think I would want to go any
14 further than that, and I didn't in this case in terms of
15 putting smaller and smaller congressional delegations into the
16 analysis.

17 I didn't find it particularly material in the end
18 and -- so no negative consequences from doing it and positive
19 consequences from expanding the pool of cases available for
20 analysis and ultimately, I think, strengthening the conclusions
21 I draw about (a) the efficiency gap in general, but the
22 efficiency gap in North Carolina in particular.

23 Q Also, in connection with your work in the Wisconsin case,
24 you were asked about your rebuttal report and I want to ask you
25 what were you explaining to the Court in the Wisconsin case

1 with respect to Jowei Chen's 2013 academic article?

2 A Okay. So I was making a point there that the Chen and
3 Rodden algorithm was drawing plans consistent with a fairly
4 minimal set of redistricting criteria, but without regard to
5 particular state-by-state requirements about redistricting. So
6 I was trying to distinguish it from the arguments we were
7 putting forward with respect to Wisconsin.

8 Q Is that criticism applicable to his work in this case?

9 A Oh. So I've been reflecting on that since the question
10 was put to me and I think the way I would characterize it is I
11 was in court all day yesterday. I heard Jowei Chen's
12 testimony. As I understood it, and it was made clear time and
13 time again, his project was to draw maps out of his computer
14 algorithm that satisfied a particular set of criteria that were
15 fit for purposes that were adhering as closely as possible to
16 the words we heard over and over as the stated criteria.

17 Having -- it seems to me he was working on a
18 different problem in his work for this case than how
19 relevant -- what he was doing in the 2013 article with respect
20 to Wisconsin. It seems to me what I heard yesterday sounded
21 extremely tailored to the particular circumstances before him
22 and before us in this matter versus what we were doing in
23 Wisconsin.

24 Q And finally, I think you were asked twice whether you had
25 prospectively done an efficiency gap calculation for a

1 redistricting plan before there had been any election under
2 that plan, but what you weren't asked and what I want to ask
3 you is: Are you aware of whether anyone else has done that?

4 A I'm aware of an instance where here in North Carolina with
5 respect to the Assembly Plan, I believe it's even a member of
6 the state legislature himself precisely, perhaps because it is
7 reasonably simple --

8 MR. STRACH: Your Honor.

9 THE COURT: Hold on just a second. Yes, sir.

10 MR. STRACH: Your Honor, may I be heard on an
11 objection to the testimony? It sounds like this is based on
12 hearsay, information that the witness does not have personal
13 knowledge of. We would object to it on that basis.

14 MS. EARLS: Well, I'm just asking if he's aware of it
15 as in throughout the work that he's done in this area.

16 JUDGE OSTEEEN: How is he aware of it? Through what
17 somebody else told him?

18 BY MS. EARLS:

19 Q Well, have you seen a report that was produced showing the
20 efficiency gap for the North Carolina legislative districts?

21 MR. STRACH: I would renew my objection.

22 JUDGE OSTEEEN: Hold on. Your objection stands.
23 Let's hear this answer.

24 Where did you get this information from?

25 THE WITNESS: It was shown to me -- it's on a website

1 where one of the submissions, I believe -- it's a website
2 collating submissions and one of the submissions has a set of
3 Excel spreadsheets that -- some of them include calculations of
4 properties of a proposed plan denominated -- you know, done
5 with respect to the efficiency gap.

6 JUDGE OSTEEEN: Were you asked to do anything with
7 that or you just saw it on the website?

8 THE WITNESS: No, it was -- it was brought to my
9 attention.

10 (Discussion between the judges.)

11 JUDGE OSTEEEN: All right. I will let you testify to
12 it and we'll take it under advisement. We'll decide the
13 objection. The objection is noted.

14 MS. EARLS: Thank you, Your Honor. I have no further
15 questions.

16 JUDGE OSTEEEN: Redirect?

17 MR. STRACH: Nothing further, Your Honor.

18 MS. EARLS: Your Honor, may I just be clear? We
19 would like to reserve the right to call Dr. Jackman on
20 rebuttal.

21 JUDGE OSTEEEN: On rebuttal.

22 MS. EARLS: Yes.

23 JUDGE OSTEEEN: Oh, during the rebuttal case?

24 MS. EARLS: That's correct.

25 JUDGE OSTEEEN: Understood.

1 MS. EARLS: Thank you, Your Honor.

2 JUDGE OSTEEEN: You may step down.

3 THE WITNESS: Thank you.

4 (At 2:39 p.m., witness excused.)

5 MS. EARLS: Your Honor, at this point the next
6 witness that the Plaintiffs would call -- I believe we've been
7 able to resolve that in agreements with counsel and that there
8 are -- but I want to put those agreements on the record so that
9 we don't have to call -- so that we are not required to call
10 those witnesses. If I may do that at this time?

11 JUDGE OSTEEEN: Okay. So you've got some agreements
12 as to some foundation or something?

13 MS. EARLS: Correct.

14 JUDGE OSTEEEN: All right.

15 MS. EARLS: So the Plaintiffs were intending to call
16 Tim Stallman to lay a foundation for Plaintiffs' Exhibits 4023
17 and 4024, and I believe that in return for those -- the
18 objections to those exhibits being withdrawn, the Plaintiffs
19 have agreed that the Defendants' witness Dr. Hofeller will
20 submit a short declaration relating only to those two exhibits
21 to give his rebuttal to what they show.

22 JUDGE OSTEEEN: So you all -- is that part of the
23 deposition testimony that will be submitted?

24 MS. EARLS: No. This would be an additional new
25 declaration by Dr. Hofeller relating only to these two

1 exhibits.

2 JUDGE OSTEEEN: Okay. So the two exhibits are going
3 to be -- we're just talking about the exhibits now?

4 MS. EARLS: Correct. If we don't have this
5 agreement, we would need to call Mr. Stallman to explain.

6 JUDGE OSTEEEN: Okay. So, Mr. Strach, as I understand
7 it, you all have withdrawn your objection to these exhibits on
8 the condition that you be allowed to submit an affidavit from
9 Hofeller.

10 MR. STRACH: I thought it included 4022 also.

11 MS. EARLS: Yes.

12 JUDGE OSTEEEN: So it's 4022 and 4023?

13 MR. STRACH: And 4024.

14 JUDGE OSTEEEN: And 4024.

15 MR. STRACH: Right.

16 JUDGE OSTEEEN: So those three exhibits no objection
17 on the condition that Hofeller can submit an affidavit.

18 MR. STRACH: That's right.

19 MS. EARLS: So I believe I would like to move their
20 admission at this time.

21 JUDGE OSTEEEN: 4022, 4023, and 4024 are admitted.

22 MS. EARLS: Thank you, Your Honor. Similarly, the
23 Plaintiffs were intending to call the past president of the
24 League of --

25 JUDGE OSTEEEN: Okay. Without regard to what you

1 intended to do, what's the agreement?

2 MS. EARLS: So the agreement is we have reached a
3 stipulation in writing, which we will file with the Court at
4 the end of the day today, regarding members in the League of
5 Women Voters, where they live and other identifiers.

6 MR. STRACH: It's a standing thing and we've agreed
7 to a short stipulation that will obviate the need for her to
8 testify.

9 JUDGE OSTEEEN: Name, address kind of stuff?

10 MR. STRACH: Sort of, kind of.

11 JUDGE OSTEEEN: All right.

12 MS. EARLS: In that case, I think we're prepared to
13 recall Dr. Chen.

14 JUDGE OSTEEEN: All right.

15 MS. RIGGS: Good afternoon, Your Honors. Allison
16 Riggs on behalf of the League of Women Voters. The League of
17 Women Voters recalls Dr. Jowei Chen.

18 JUDGE OSTEEEN: Dr. Chen, as I'm sure you recall
19 yesterday, as Judge Britt said, we only swear you once. You're
20 still under oath in this case.

21 MS. RIGGS: Your Honors, may I approach and give
22 Dr. Chen his notebook back?

23 JUDGE OSTEEEN: Is this expert report in here from
24 Dr. Chen the same one that was introduced yesterday?

25 MS. RIGGS: Absolutely, Your Honors. We're going to

1 be using that same smaller notebook and actually, as a matter
2 of housekeeping at this time, I would like to move the
3 admission of Joint Plaintiffs' Exhibit 2010, which is the Chen
4 report; 2011 which is Figure A -- it's under a separate tab --
5 and Joint Plaintiffs' Exhibit 2012, Dr. Chen's CV.

6 JUDGE OSTEN: Wait a minute. I've forgotten our
7 numbers from yesterday. Any objection to these exhibits?

8 MR. STRACH: No, Your Honor.

9 JUDGE OSTEN: Were those the same numbers from
10 yesterday?

11 MS. RIGGS: Yes, they're joint plaintiff
12 exhibit numbers.

13 JUDGE OSTEN: They're admitted.

14 MS. RIGGS: Thank you, Your Honors.

15 JOWEI CHEN,

16 PLAINTIFF'S WITNESS, PREVIOUSLY SWORN

17 DIRECT EXAMINATION

18 BY MS. RIGGS:

19 Q Thank you for returning to the stand, Dr. Chen. I would
20 like to talk with you about the three simulation sets that you
21 explained on the stand yesterday, but go into the analyses that
22 you didn't talk about with Mr. Thorpe in much detail.

23 To refresh our memory, though, very quickly, what
24 were the criteria you used for the first simulation set?

25 A Simulation Set One I had the computer draw 1,000

1 districting plans that strictly followed, complied with the
2 nonpartisan portions of the Adopted Criteria. We talked about
3 those at great length yesterday.

4 Q You previously showed the Court your results for this
5 simulation set looking at the seat distributions using both
6 Hofeller's 7-election set and the General Assembly's
7 20-election set. Did you also use those elections to calculate
8 the efficiency gap score of each of your simulated plans in the
9 first simulation set?

10 A Yes, I did in the report.

11 Q Okay. Can you explain how you calculated the efficiency
12 gap score for each of your simulated plans?

13 A I calculated it exactly the same way as what Dr. Jackman
14 had just explained earlier today. So I looked at the total
15 number of wasted votes for each of the two parties. You go
16 through district by district, just as Dr. Jackman laid out in
17 detail. Go through district by district, count up the number
18 of total wasted votes for Democrats, total wasted votes for
19 Republicans.

20 Just to repeat what he said, you look at the number
21 of votes that each party has in a district that the party loses
22 and all of those votes are wasted. In districts that a party
23 wins, you only look at the votes in excess of the 50 percent
24 plus one threshold needed for victory.

25 Anyways, you calculate the total number of wasted

1 votes for each party across all districts; and then you
2 aggregate them all together across the 13 districts and ask
3 what was the total number of wasted Republican votes, what was
4 the total number of wasted Democratic votes; and the difference
5 of that divided by the total number of statewide votes for
6 North Carolina, that gives us the efficiency gap.

7 Q Did you create a set of charts that show the results of
8 your efficiency gap calculations for your first simulation set?

9 A Yes, I did in the report.

10 MS. RIGGS: Can we publish Figure 9 of Exhibit 2010?
11 It's on page 32 of the Chen report.

12 Q Dr. Chen, can you explain what we're seeing in these two
13 charts that comprise Figure 9?

14 A These two charts here are just characterizing the 1,000
15 simulations that we discussed at length yesterday in Simulation
16 Set No. 1, except this time on the horizontal axis on both of
17 these figures I'm reporting the efficiency gap, and I'm
18 reporting the efficiency gap in two different ways.

19 On the left, I've calculated the efficiency gap using
20 Dr. Hofeller's formula; and on the right, I've calculated the
21 efficiency gap using the 20-election Adopted Criteria formula
22 that I described yesterday. Again, this is using the 20
23 elections that were specified by the Adopted Criteria to be
24 used in assessing the partisanship of North Carolina
25 congressional districts, those 20 elections from 2008 to 2014.

1 So I've calculated the efficiency gap along the horizontal axis
2 in two different ways in these two figures. Along the vertical
3 axis I've reported the Reock compactness score of all these
4 plans.

5 So just like all those figures that we looked at
6 yesterday, what's going on in both of these figures is I'm
7 comparing the Enacted SB2 Plan against the 1,000 simulated maps
8 that I produced in Simulation Set No. 1. And as I just said,
9 we're comparing them along the horizontal axis in terms of
10 their efficiency gap and along the vertical axis in terms of
11 their mean compactness score as measured by the Reock measure.

12 Q And just to clarify on these two charts, how is the
13 efficiency gap score for the SB2 Plan denoted on the chart?

14 A The Enacted SB2 Plan has an efficiency score that is
15 denoted by that red star that you see and it appears in the
16 lower left corner of each of these two figures.

17 So you can see on the left that the SB2 Plan, the
18 2006 Congressional Plan, the enacted plan has an efficiency gap
19 score of approximately negative 24 percent. On the right
20 figure, we see that using the 20 elections -- so the left
21 figure, again, was using Dr. Hofeller's formula to calculate
22 the efficiency gap.

23 Now, on the right figure when we calculate the
24 efficiency gap using the 20 elections from the Adopted Criteria
25 formula, we get an efficiency gap of approximately negative

1 30 percent.

2 All of these -- both of these just indicate to us
3 that there are far more wasted Democratic votes than Republican
4 votes regardless of which measure, which election formula we
5 use, whether Dr. Hofeller's measure or the Adopted Criteria
6 formula.

7 Q Now, Dr. Chen, how would you describe the distribution of
8 efficiency gap scores that you see for your first set of 1,000
9 simulated plans?

10 A Well, to answer that, let's take a look at the
11 distribution of those black circles that we see on -- let's
12 just look at the figure on the left.

13 So there are 1,000 black circles here, and they
14 represent the efficiency gap scores, as well as the Reock
15 scores; but along the horizontal axis you see the efficiency
16 gap of those 1,000 plans. And what we can see in the figure on
17 the left is that the most likely outcome, the row that you see
18 in the middle -- the column that you see in the middle there,
19 the most likely outcome among these 1,000 simulated plans is an
20 efficiency gap that is very close to 0 percent, ranging from
21 about roughly about negative 2 percent to about positive
22 1 percent. In other words, all very close to 0 percent. So
23 that's a very, very -- that's the most common outcome.

24 Of course, there's an entire range, and you see
25 efficiency gaps along these 1,000 simulated plans with as low

1 as negative 16 percent or so and as high as about positive
2 15 percent, but that's the entire range. And, again, the most
3 common outcome is very close to 0 percent in efficiency gap.

4 Q So how does the efficiency gap score for SB2 compare to
5 the efficiency gap scores you see in your simulated plans?

6 A Again, just sticking to that figure on the left, the SB2
7 Plan's efficiency gap is shown to us by that red star that you
8 see on the lower left of that figure on the left. The SB2 Plan
9 has got an efficiency gap score of negative 24 percent. That
10 is an extreme partisan outlier and it is entirely outside the
11 entire range of the efficiency gaps of all 1,000 of the
12 simulated maps in Set No. 1.

13 Q Do the efficiency gap scores for your first set of
14 simulated plans tell you anything about North Carolina's
15 political geography?

16 A Yes. It tells us pretty clearly that North Carolina's
17 political geography makes pretty reasonable a plan with an
18 efficiency gap score of right around 0 percent. In other
19 words, it tells us that North Carolina's political geography is
20 not very strongly or inherently very strongly biased against or
21 for one party or the other.

22 Q Is the enacted plan, so SB2 -- the SB2 Plan's efficiency
23 gap score, in any way caused or explained by the state's
24 political geography?

25 A No. The results that we see here both in the figure on

1 the left and the right are showing us pretty clearly that the
2 enacted plan -- the SB2 Plan's efficiency gap -- its extreme
3 efficiency gap is not explained by North Carolina's voter
4 geography. It's not the natural product of taking North
5 Carolina's voter geography -- its VTDs, its counties, its
6 census, geography, and its voters -- and imposing a districting
7 process adhering to the nonpartisan portions of the Adopted
8 Criteria. Clearly, the SB2 Plan's efficiency gap, its extreme
9 efficiency gap, is a product of something that is deviated far
10 from such a process.

11 Q Okay. And then do the efficiency gap scores you see for
12 the simulated plans also tell you anything about whether
13 compliance with traditional redistricting criteria in North
14 Carolina favors one political party or another?

15 A It tells us that if you follow a traditional -- if you
16 follow a districting process that adheres to just the
17 traditional districting criteria listed in the Adopted
18 Criteria -- and those are the only districting criteria I'm
19 talking about here, the nonpartisan portions of the Adopted
20 Criteria -- you follow such a process, you end up with plans
21 that don't systematically favor one party or another in terms
22 of the efficiency gap. In other words, you look at this
23 distribution, as well as the most common outcomes here in terms
24 of the efficiency gaps of these 1,000 simulated maps; and
25 they're not maps that systematically favor the Democrats or the

1 Republicans in one way or another. There's no substantial bias
2 here in the distribution of efficiency gaps we see on this
3 figure.

4 Q So then to take that another way, is the enacted plan's
5 efficiency gap score caused or explained by compliance with
6 traditional redistricting criteria?

7 A Definitely not. What we're seeing here is that the
8 enacted plan -- the Enacted SB2 Plan's efficiency gap is an
9 extreme partisan outlier and it is entirely outside of the
10 range of plans that would have emerged had they followed -- had
11 the districting process followed the nonpartisan portions of
12 the Adopted Criteria.

13 Q Now, let's turn to your second simulation set, the second
14 1,000 simulations you ran. Again, very briefly, can you remind
15 us what criteria you used for the second simulation set?

16 A The second simulation set was exactly like the first one,
17 following the nonpartisan portions of the Adopted Criteria,
18 with one addition. I instructed the computer in the second set
19 to explicitly protect all 13 incumbents, that is, to make sure
20 that each of the 13 incumbents reside within his or her own
21 district with no pairing of incumbents. That's the only
22 difference from Simulation Set No. 1.

23 Q And did you create charts like the ones we just went over
24 that show the results of your efficiency gap analysis for the
25 second simulation set?

1 A I did in Figure 10.

2 MS. RIGGS: Okay. So can we publish Figure 10, which
3 is on page 33 of Exhibit 2010, the Chen report?

4 BY MS. RIGGS:

5 Q Dr. Chen, do we -- do we read this chart the same way we
6 read the last one we discussed?

7 A It is laid out in exactly the same way. Efficiency gap is
8 on the horizontal axis. The Reock compactness score is on the
9 vertical axis in both figures. Again I'm showing
10 Dr. Hofeller's formula on the left and the 20 Adopted Criteria
11 elections formula on the right.

12 Q So in this second set of simulation sets -- simulation
13 set, how would you describe the distribution of efficiency gap
14 scores for the second set?

15 A It's largely the same as we just saw a minute ago in Set
16 No. 1. The most likely outcome is a plan with an efficiency
17 gap score of very close to 0 percent, around about negative
18 2 percent to approximately positive 1 percent. The general
19 range of distribution is nearly identical to what we just saw
20 with Simulation Set No. 1 as well, so the results are largely
21 the same.

22 Q And in Simulation Set Two, how does the enacted plan's
23 efficiency gap score compare to the simulation set efficiency
24 gap scores?

25 A Once again we see that the Enacted SB2 Plan's efficiency

1 gap on the left figure using Dr. Hofeller's formula, the SB2
2 Plan has an efficiency gap of negative 24 percent, same as in
3 the previous figure. That is an extreme partisan outlier and
4 it is an outcome entirely outside of the entire range of the
5 1,000 simulated plans in Set No. 2.

6 Q So then based on this analysis, what is your opinion about
7 whether the efficiency gap score of the North Carolina Enacted
8 Plan is caused or explained by not pairing incumbents?

9 A It tells us that even if you shift to a districting
10 process that explicitly tries to -- tries to protect incumbents
11 by not pairing them, even that districting criterion does not
12 explain the extreme efficiency gap of the Enacted SB2 Plan.

13 Q Turning then to your third set of simulations, as a quick
14 reminder, what were the criteria you used for the last set of
15 1,000 simulations?

16 A In Simulation Set No. 3, I instructed the computer to
17 simply match, not exceed but to simply match, the enacted
18 plan's specific features of having exactly 13 split counties
19 and 11 protected incumbents and to do no better and no worse.

20 MS. RIGGS: And now can we publish Figure 11 of
21 Exhibit 2010, the Chen report, which is on page 34?

22 BY MS. RIGGS:

23 Q Dr. Chen, what does Figure 11 depict?

24 A Figure 11 is exactly the same in layout as the two
25 previous figures we've just been looking at. So once again it

1 describes Simulation Set No. 3 and its 1,000 simulated plans
2 with the efficiency gaps of those simulated plans, as well as
3 the enacted plan, depicted along the horizontal axis; and the
4 vertical axis in these two figures tells you the mean Reock
5 compactness score of all of these plans. So once again we're
6 comparing the Enacted SB2 Plan against 1,000 simulated plans.

7 Q And then in this last set, can you describe the
8 relationship between the distribution of efficiency gap scores
9 we see for your last set of 1,000 simulations as compared to
10 the efficiency gap score for the enacted plan?

11 A The distribution of efficiency gaps for these 1,000
12 simulated plans we're seeing here in Figure 11 is virtually
13 identical to what we've been seeing in the previous two
14 figures. We're seeing here that the most common outcome with
15 Simulation Set No. 3 with either of these two measures of
16 partisanship, whether we use the Dr. Hofeller formula or the
17 Adopted Criteria 20-elections formula, the most common outcome
18 is a simulated plan -- among the simulations, the most common
19 outcome is a simulated plan with very close to 0 percent
20 efficiency gap. The distribution is virtually identical to
21 what we had just seen with Simulation Sets One and Two.

22 Q So based on this analysis, what is your opinion about
23 whether the efficiency gap of North Carolina's enacted
24 congressional plan is explained or caused by the fact that the
25 plan splits exactly 13 counties and protects only 11

1 incumbents?

2 A It's pretty clear from these results -- compared against
3 the previous two simulation sets, it's really clear from
4 Simulation Set Three, these results here, that even if the
5 General Assembly had specifically set out to follow a
6 districting process that specifically wanted to split exactly
7 13 counties and to protect exactly 11 incumbents, no more and
8 no less, that even that unique combination of features would
9 not explain or necessitate or justify creating a plan with as
10 extreme of an efficiency gap as what we see in the SB2 Enacted
11 Plan, and that is a very strong statistical conclusion we can
12 draw from these figures regardless of whether we use
13 Dr. Hofeller's formula or the Adopted Criteria formula for
14 measuring the partisanship of districts.

15 Q So to wrap up our discussion of your efficiency gap
16 analysis on the three sets of 1,000 simulations you ran, I just
17 want to ask a couple of questions about the simulations. Is
18 the point of running these simulations to produce better maps
19 that the legislature could have enacted?

20 A No. The point is not to produce better maps or the best
21 maps one could possibly imagine using whatever criteria one can
22 think of. That's not the point. The point isn't to produce
23 better maps. The point here is to hold several redistricting
24 factors constant, specifically, as I've been describing, the
25 nonpartisan criteria, the nonpartisan redistricting factor set

1 forth in the Adopted Criteria.

2 So the point is to hold several redistricting factors
3 constant so that -- and to produce a large number of plans
4 under such a process holding these redistricting factors
5 constant so that I can go and analyze these plans and determine
6 whether or not the Enacted SB2 Plan could have possibly or even
7 plausibly been the result of an attempt to actually comply with
8 those nonpartisan factors or whether the SB2 Plan can only be
9 explained as an attempt to solely pursue, predominantly pursue
10 the partisan criterion laid forth in the Adopted Criteria.
11 That is the partisan goal of creating a ten Republican map. So
12 that's the point of creating these simulated maps, not
13 necessarily to produce the best maps or better maps.

14 Q Dr. Chen, in your academic work using these simulations,
15 do you ever see enacted plans that fall within the range of
16 characteristics you observe in simulated plans?

17 A Oh, you're just asking about my normal academic published
18 work.

19 Q Yes.

20 A Well, sure. I mean, I study districting plans across all
21 sorts of states and jurisdictions, congressional and state
22 legislative plans; and I compare them very frequently to
23 computer-simulated plans following various combinations of
24 traditional districting criteria; and in those states, that's
25 usually what happens. You usually see congressional or state

1 legislative plans that fall entirely within the range of plans
2 that are produced by a computer that just followed traditional
3 districting criteria. That's kind of the point of traditional
4 redistricting criteria, that they are commonly used districting
5 criteria.

6 Q Now I would like to pivot to the next inquiry you
7 performed for the League of Women Voters Plaintiffs. In all of
8 the analyses we've discussed so far, what type of elections did
9 you use to calculate the efficiency gap?

10 A In everything that we have discussed thus far today, I
11 have exclusively been using statewide elections, specifically
12 the 20 statewide elections, excluding presidential elections,
13 mentioned by the Adopted Criteria, as well as the seven
14 elections named in Dr. Hofeller's formula. So those are
15 statewide elections, things like the gubernatorial, Attorney
16 General, et cetera.

17 Q And to be clear, were any of those congressional
18 elections?

19 A Well, they were not because congressional elections were
20 not listed in Dr. Hofeller's formula, nor were congressional
21 elections included in the 20 elections listed in the Adopted
22 Criteria. So, no, no congressional elections.

23 Q Did you also carry out a version of your analysis using
24 congressional election results?

25 A I did in the latter half of my reports.

1 Q Why?

2 A I wanted to incorporate congressional elections because I
3 wanted to be able to measure and to incorporate the various
4 features that affect -- the various features and factors that
5 affect congressional elections that don't come up in statewide
6 election races.

7 So when we think about the statewide races that we've
8 been talking about thus far, things like gubernatorial races,
9 the US Senate races, these are races that are uniform across
10 all of North Carolina. You have the same ballot in every
11 single county in North Carolina for these races. That means
12 whatever incumbency advantage, whatever candidate quality
13 factors come up, they are the same for all counties and the
14 same for, obviously, all congressional districts.

15 Now, congressional elections are a little bit
16 different. Congressional elections are different for every
17 district. In every district you have a different combination
18 of candidates and thus a different combination of candidate
19 qualities. You have, for example, differing issues of
20 incumbency in these different races. I wanted to be able to
21 account for those various features, so that's why I
22 incorporated congressional election results into my report, as
23 solely a robustness check in order to account for these various
24 factors.

25 Q So then how did you use congressional election results to

1 do the next part of your analysis?

2 A Well, I conducted a regression predictive model -- a
3 predictive regression model. So it's a regression model that
4 incorporates congressional elections in the following way: I
5 used in this regression model presidential results from 2012 in
6 order to predict congressional election results in 2012 while
7 simultaneously accounting for and measuring factors such as
8 incumbency, whether or not each congressional race had a
9 Democratic or Republican incumbent. So I conducted this
10 analysis, this regression model, in order to be able to account
11 for the various factors that affect congressional races,
12 including incumbency advantage.

13 Q And are the details of how you developed that predictive
14 regression model on pages 26 to 28 of your report and Figure 12
15 on page 35 of your report?

16 A Yes. In addition, there's Table 2 which lays out the
17 details of the results of that regression model that I just
18 described.

19 Q Is developing predictive regression models like you've
20 just described a common practice in the political science
21 field?

22 A It's a very standard practice. We use it in order to
23 incorporate the various features and factors that affect
24 congressional races and to estimate some of those factors,
25 things like incumbency advantage.

1 Q So speaking of that, using the regression models that you
2 developed to predict congressional votes in the simulated
3 districts, what did you find with respect to the effect of
4 having a Democratic or a Republican incumbent in the simulated
5 districts?

6 A The effect of having an incumbent in the districts is the
7 following: I found in this regression model that I just
8 described that having an incumbent of your own party boosts
9 your party's vote share in the congressional election by
10 approximately 3 percent. And that goes for both parties.

11 So, in other words, if you have a Republican
12 incumbent in a particular district, then typically the
13 Republican candidate's vote share, all else being equal, will
14 be about three percentage points higher as a result of having
15 that candidate be a Republican incumbent. Same for the
16 Democrats. If you've got a district with a Democratic
17 incumbent, Democratic candidate's vote share will, all else
18 being equal, be about three percentage points higher. So the
19 incumbency effect is approximately 3 percent and it's roughly
20 equal, I find in my regression results, for both parties.

21 Q So once you developed these predictive regression models
22 and the predicted congressional vote is established, what did
23 you do next as part of your analysis?

24 A I then took the results of that regression model -- of
25 that regression analysis and then I applied that model as an

1 alternative way to measure the partisanship of North Carolina
2 congressional districting plans, both of the SB2 Enacted Plan,
3 as well as a thousand simulated plans.

4 Q Using then those predicative models, how did you account
5 fully for the incumbency effect?

6 A I accounted for the incumbency effect -- applying that
7 regression model, I accounted for an incumbency effect in two
8 different ways, two completely separate, independent analyses.

9 One analysis was assuming that all districts are
10 going to have exactly the incumbents that they had as of
11 November 2016, all 13 incumbents in place in their respective
12 districts as of 2013 -- sorry -- as of November 2016. So that
13 first analysis assumes that incumbents are all there.

14 And then I did a second analysis in which I made the
15 opposite assumption. I assumed -- very hypothetically, of
16 course, I assumed that there were no incumbents at all and that
17 all 13 races would be open seats.

18 So, again, I did two separate analyses and I did that
19 in order to make sure that I had -- I was able to account for
20 and determine whether incumbency could explain the extreme
21 partisan results we've been seeing in the SB2 Plan thus far.

22 Q So using the models in those two different approaches,
23 what did you find with respect to whether incumbency -- the
24 incumbency effect explained the outlier nature of SB2?

25 A I found that even accounting for incumbency advantages,

1 all of the incumbents and all of the advantages that they enjoy
2 as a result of being incumbents as of November 2016, even after
3 fully accounting for that incumbency advantage, did not change
4 my results at all. It allowed me to conclude that even
5 incumbency could not explain -- the incumbency advantage could
6 not explain the extreme statistically outlying nature, the
7 partisan nature of the Enacted SB2 Plan.

8 Q And how did your analysis using congressional results like
9 we just discussed affect your conclusions you reached earlier
10 using noncongressional elections?

11 A It was just a robustness check and that robustness check
12 strengthened my conclusions even further. It strengthened my
13 conclusions or it confirmed my conclusions even further that
14 the enacted plan's creation of a 10 Republican map -- of a 10-3
15 map was an extreme statistical outlier and it could not be
16 explained, certainly not by compliance with the nonpartisan
17 portions of the Adopted Criteria, but also could not be
18 accounted for or explained for reasons of incumbency advantage.
19 Basically, that was all a robustness check designed to make
20 sure that we weren't missing anything by not considering
21 incumbency advantage. So that's why I did all of that.

22 Q All right. Dr. Chen, now I want to discuss the last piece
23 of your analysis in this case. To go back and remind the
24 Court, did you take into account racial considerations in
25 developing your algorithm you used for the simulations?

1 A I did not. The Adopted Criteria told the map drawer to
2 completely ignore the race of voters, the race of census
3 geographies, so I completely ignored race in the construction
4 of my computer simulations.

5 Q So given that fact, though, if you wanted to determine
6 whether the presence of a 40 percent black voting-age
7 population district could cause the partisan asymmetry that
8 you've described in your previous testimony, could you do that
9 with the simulations you already ran?

10 A Maybe. It depends. I mean, I would look at the
11 simulations I've already ran, but there's an important question
12 to ask, whether or not any of those simulated plans actually
13 contained a district with such a characteristic, a district
14 with a 40 percent black voting-age population.

15 Now, if I went back and analyzed all of those
16 simulations and I found that none of them contained such a
17 district, then we would be out of luck. I wouldn't be able to
18 conduct such an analysis. But if I went back and I found that
19 some number of them actually did, then we could analyze those,
20 and then I would be able to answer that question.

21 Q And did some of the 3,000 simulated plans have such a
22 district with at least 40 percent black voting-age population?

23 A Well, I went back and calculated, and I found that a
24 sizeable number in each set of simulations -- each of the three
25 sets of simulations, I found that a sizeable number actually

1 did satisfy that feature, actually had a district with at least
2 40 percent black voting-age population.

3 Q So after you identified the districts that did have one --
4 the plans -- the simulated plans that did have one district
5 with 40 percent black voting-age population, what did you do?

6 A Well, I isolated them. I just counted them up. I picked
7 them out. It turned out to be 262 total plans across the three
8 sets of simulations. And I reanalyzed them. After isolating
9 them, I reanalyzed them in terms of the same partisan measures
10 that I had been describing yesterday, looking at their
11 partisanship in terms of the number of Republican districts as
12 measured both by Dr. Hofeller's formula, as well as by the
13 Adopted Criteria formula of using 20 --

14 MR. STRACH: Your Honor, objection. I feel like this
15 is material that we covered in Dr. Chen's first round of
16 testimony and I'm -- we certainly asked him about the 262 plans
17 that have 40 percent BVAP districts, and I thought this was
18 material that was already covered. So I thought this was
19 supposed to be on material that we had not already covered.

20 MS. RIGGS: Mr. Thorpe didn't bring this up in his
21 direct examination and we tried to indicate to the Court that
22 anything left in the report is what I was covering today. It's
23 a brief module. We're almost done.

24 JUDGE OSTEEEN: Let's keep it brief. I understood
25 that we were -- today we were coming back for what had to have

1 a foundation laid by another witness, Dr. Jackman, so let's
2 move on through this. I'll overrule and let you get into it,
3 but make it quick.

4 BY MS. RIGGS:

5 Q Let's -- if you could turn with me to Tab 2011, which is
6 Figure A of your report.

7 A Yes.

8 Q Very briefly, Dr. Chen, what do these charts show?

9 A The two charts in Simulation Set No. 1 here on this first
10 page show us that the distribution of these simulations, these
11 85 plans that contain one district with over 40 percent black
12 voting-age population, it's a distribution that is virtually
13 identical to the distribution that we saw yesterday where I
14 described all 1,000 of those plans.

15 The most common outcome is creation of a seven
16 Republican district under the Dr. Hofeller formula; and under
17 the 20 Adopted Criteria elections formula, the most common
18 outcome is six Republican districts. So what we're seeing here
19 is the distribution is virtually identical to what we had seen
20 yesterday when we looked at all 1,000 of the simulations.

21 Q So then, Dr. Chen, based on this analysis, does having a
22 district with 40 percent black voting-age population explain
23 having a plan with ten Republican and three Democratic
24 districts?

25 A Clearly not, because even when we isolate plans that

1 contain one black -- one 40 percent black voting-age population
2 district, even then it's pretty clear that the Enacted SB2 Plan
3 is an extreme statistical outlier in partisanship.

4 MS. RIGGS: No further questions.

5 JUDGE OSTEN: Cross-examination?

6 MR. STRACH: Thank you, Your Honor.

7 CROSS-EXAMINATION

8 BY MR. STRACH:

9 Q Dr. Chen, I think I heard you say that there is no
10 difference between the way that you and Dr. Jackman calculate
11 your efficiency gap. Was that correct?

12 A Yeah, I listened to Dr. Jackman describe how he calculates
13 it and that was consistent with my understanding of the
14 efficiency gap.

15 Q Is it your understanding that Dr. Jackman uses actual
16 election results to make the calculation?

17 A I understand that he uses congressional -- actual
18 congressional election results when they're available, yes,
19 sir.

20 Q All right. And you did something a little bit different,
21 isn't that correct, in terms of the data that you used?

22 A Yes, sir. As I explained just a few minutes ago, I used
23 the actual election results, but the election results using,
24 number one, Dr. Hofeller's formula, so those are seven
25 statewide elections; number two, the Adopted Criteria

1 elections, 20 statewide elections; and then my predictive
2 model. But, yes, it's a little bit different in that respect.

3 Q So you used different election data than Dr. Jackman did
4 to compute the efficiency gap values?

5 A Yes, sir, you're correct about that distinction, different
6 sets of elections.

7 Q Isn't it true that when you used the election data that
8 you used to compute the efficiency gap the efficiency gap was
9 higher than Dr. Jackman's value?

10 A I recall him reporting a 19.4 percent and definitely my
11 calculations, using a different set of elections, it turned out
12 to be greater in magnitude. I think what -- I would
13 characterize it as more negative, but I get what you're saying.

14 Q Okay. I want to understand the -- in the robustness check
15 section of your report, as I see it, I believe on page 24, it
16 looked to me like you used the Reock compactness test in this
17 section, is that correct?

18 A Yes, sir. You're talking, though -- you're asking which
19 figures I show that Reock compactness calculation in?

20 Q Well, I just asked you: You used the Reock compactness in
21 this section, correct?

22 A Yes, sir, that is correct.

23 Q Now, in the -- I thought in your prior analysis with your
24 simulation sets you used the Polsby-Popper.

25 A I used both. Earlier I had shown -- you and I discussed

1 yesterday how I measured it using both Reock and Popper-Polsby,
2 and here in these figures I only showed the Reock, and that was
3 just for brevity. I really only had space in a two-dimensional
4 figure to show one measure of compactness, so I chose the
5 Reock. I could have just as easily shown the Popper-Polsby
6 with very little difference in results.

7 Q Do you report the Popper-Polsby anywhere in this section
8 of the report?

9 A Oh, let me just clarify because I actually do.

10 Q Okay.

11 A It's the same set of simulations as what you and I had
12 discussed yesterday. So I did report the Popper-Polsby scores
13 for all of these simulated plans in the earlier figures in the
14 report. These I'm just reanalyzing the same set of 3,000
15 simulated plans. So you've already got the Popper-Polsby
16 scores that you and I discussed yesterday.

17 Q All right. And when you calculate the efficiency gap
18 values using the data that you used, you're comparing the
19 values from the 2016 Plan to your simulation sets, correct?

20 A You're asking if I use 2016 elections?

21 Q You're comparing the efficiency gap value of the 2016 Plan
22 against the values that are derived from your simulation sets,
23 correct?

24 A Okay. I got you. Yeah, that is correct. So I'm
25 calculating the efficiency gap of the Enacted SB2 Plan enacted

1 -- the 2016 Plan and I'm comparing that against all of my
2 various simulated plans.

3 Q And your simulated plans were constructed with some effort
4 to not use any criteria that you deemed partisan, correct?

5 A In Simulation Set One, that was true. As we described at
6 length yesterday, Set No. 2 does account for incumbency and so
7 does Set No. 3.

8 Q All right. But none of the sets account for incumbency by
9 trying to determine who could win a district, correct? It just
10 does nonpairing?

11 A That's correct. I was always in the simulated plans
12 ignoring the Adopted Criteria's mandate to create a ten
13 Republican map.

14 Q Right. And so you were scrupulously limiting your
15 simulation sets criteria to nonpartisan criteria, correct?

16 A I just didn't want to characterize it as nonpartisan, but
17 I think we're in agreement about what you're talking about.

18 Q All right. So is it surprising -- would it really be
19 surprising to you that the efficiency gap measure of a plan
20 drawn by a legislature would exhibit more partisanship than
21 your simulation sets that were purposefully drawn with no
22 partisan criteria?

23 A Does it surprise me that a partisan gerrymandered plan
24 would exhibit a more significant efficiency gap score than my
25 nonpartisan simulation process?

1 Q No. Does it surprise you that a plan drawn by a
2 legislature would exhibit a higher efficiency gap value than
3 your simulation plans which you scrupulously avoided
4 considering any politics in?

5 A I guess you're asking about a hypothetical legislature and
6 I don't have an opinion or a prediction about that matter. I
7 really don't try and predict what a legislature is or is not
8 going to do. I simply -- the only thing I'm good for is
9 evaluating plans that have already been drawn.

10 Q All right. And you're evaluating them, in terms of your
11 efficiency gap analysis, assuming that nonpartisan factors were
12 taken into account. That's what you're evaluating the
13 Legislature's Plan against, correct?

14 A I am not assuming anything about what the North Carolina
15 General Assembly did or did not do. I am simply building into
16 my computer algorithm what the General Assembly said it was
17 instructing the map drawer to do through the Adopted Criteria,
18 at least the nonpartisan portions of it. So I made no such
19 assumptions about what the legislature actually did.

20 Q So if the -- if the United States Supreme Court were to
21 say that a legislature is entitled to consider some amount of
22 politics in a plan, but not too much, and your simulation sets
23 don't consider politics at all, your analysis would not help
24 the Court decide whether or not a legislature's plan had gone
25 too far, isn't that correct?

1 A I really don't have an opinion because I think that
2 requires a legal judgment. So I don't have an opinion on
3 whether the Court is going to find my analysis useful or not.
4 I just try to report exactly what I find empirically and that's
5 all I can do.

6 Q You mentioned -- if you'll turn to page 26 of your report
7 where you talk about the regression modeling. You note in the
8 first paragraph -- and I'll start reading from about halfway
9 down the first paragraph. "The results from any given
10 legislative election may deviate from the long-term partisan
11 voting trends of the district's voters" --

12 A If I could just ask you to orient me where you're reading
13 from.

14 Q Oh, sorry. Page 26 and the first paragraph.

15 A Okay. Thank you.

16 Q And about middle of the way down. "The results from any
17 given legislative election may deviate from the long-term
18 partisan voting trends of the district's voters due to such
19 factors as incumbency advantage, the presence or absence of a
20 quality challenger, anomalous difference between the candidates
21 in campaign efforts or campaign finances, candidate scandals,
22 and coattail effects." You go on to say: "These factors can
23 even differ across different districts within the state of
24 North Carolina, thus making it statistically unreliable to
25 combine and directly compare election results from different

1 congressional districts when evaluating a new districting
2 plan." Do you see that?

3 A Yes, sir.

4 Q So when you -- tell me exactly how you accounted for in
5 your modeling the difference between candidates and campaign
6 efforts or finances, candidate scandals, and coattail effects.

7 A Yeah, I was giving a list of all these different myriad of
8 factors that make a difference in various congressional
9 elections that vary in various congressional elections across
10 any state, and the point was to point out a lot of these
11 factors and to say, Here is why I am using congressional
12 elections in this predicative model in the way that I'm doing
13 in this section here.

14 So the reason I'm bringing in congressional elections
15 and using this regression modeling is to be able to draw upon
16 results that have resulted from, that have come from a bunch of
17 different district elections across the entire state of North
18 Carolina and to make sure that my results are robust even after
19 we incorporate such election results.

20 Q So you don't isolate or control for in your analysis
21 specifically the campaign finances of candidates in any
22 specific districts, do you?

23 A Oh, no, no. That's not the point here at all. The point
24 is to point out that here is why we are interested in looking
25 at congressional election results and here is how I do it, by

1 drawing upon congressional election results that have come from
2 very different congressional districts all across North
3 Carolina.

4 Q All right. So you've attempted to account for these
5 things like campaign finances, candidate scandals, and coattail
6 effects simply by using the congressional election results?

7 A Yeah. I mean, the point is that there are a bunch of
8 different factors. I'm not saying that, you know, any of these
9 particular factors were especially or were not especially
10 important in North Carolina congressional elections in any
11 given year. They're just examples to help illustrate to you
12 the source of a myriad of factors that come up in election
13 races. That's it. Nothing more, nothing less.

14 Q Okay. So if you look with me on page 30 of your report at
15 the very top of the page, first paragraph, in the second
16 sentence, it says: "Instead, the enacted plan could have been
17 created only through a process in which the explicit pursuit of
18 partisan advantage was the predominant factor, thus
19 subordinating the traditional districting criteria from the
20 Adopted Criteria." Do you see that?

21 A Yes, sir.

22 Q But this analysis doesn't actually answer the question of
23 whether politics was the predominant factor because your
24 analysis didn't take politics into account at all, correct?

25 A No, that's not the way to interpret what I'm doing here at

1 all. The point -- as I've said earlier today, the point of the
2 analysis that I did was to hold several redistricting factors
3 constant, the nonpartisan portions of the Adopted Criteria, in
4 order to determine whether or not the enacted plan could have
5 possibly been the result of adhering to those nonpartisan
6 criteria or whether they were simply the result of the explicit
7 partisan goal set forth in the Adopted Criteria, the partisan
8 goal of creating a 10-3 map. So I was trying to determine
9 which was the correct answer.

10 Q All right. So what you didn't -- what you weren't trying
11 to answer or what you didn't try to answer is to determine,
12 whether if some amount of partisanship was used or was
13 appropriate to be used, whether the 2016 map would still be an
14 outlier in light of its use of politics?

15 A I want to try to answer your question. I think the answer
16 to your question is I definitely did not attempt to determine
17 whether or how much it was appropriate to use politics in the
18 districting process.

19 Q Okay. Thank you.

20 A And that's obviously because I have no legal expertise on
21 the matter.

22 MR. STRACH: Thank you. Your Honor, that's all I
23 have.

24 JUDGE OSTEN: Redirect?

25 MS. RIGGS: None, Your Honor.

1 JUDGE OSTEEEN: All right. You may step down.

2 We'll take our afternoon recess. We'll be in recess
3 for 15 minutes.

4 (At 3:28 p.m., break taken.)

5 (At 3:46 p.m., break concluded.)

6 THE COURT: All right. Mr. Earls, are you ready to
7 call your next witness or where do we stand?

8 MS. EARLS: If I may advise the Court on where I
9 believe we are. There's an additional agreement that was
10 reached with the Defendants that we want to inform the Court
11 about regarding Dr. Hofeller's potential testimony and there's
12 an affidavit or a declaration, rather, that was submitted
13 subsequent to his deposition in this case; and with the certain
14 paragraphs, I don't know, deleted from that affidavit, there's
15 an agreement that that be admitted instead of calling
16 Dr. Hofeller to testify.

17 Am I representing that correctly?

18 MR. STRACH: That's correct.

19 JUDGE OSTEEEN: You all haven't had a chance to redact
20 it and give final approval yet?

21 MR. STRACH: We've marked the paragraphs, but we
22 haven't actually redacted it yet.

23 MS. EARLS: So I assume we'll -- that is an exhibit
24 on the exhibit list.

25 MR. STRACH: Right.

1 JUDGE OSTEEEN: And it's coming in in your case or
2 their case?

3 MS. EARLS: Their case.

4 JUDGE OSTEEEN: Okay.

5 MS. EARLS: But it is part of the agreements that
6 we've made.

7 JUDGE OSTEEEN: All right.

8 MS. EARLS: And then Mr. Speas has some exhibits that
9 he wants to move admission of.

10 MR. SPEAS: Your Honor, I think these are in, but in
11 case they are not, Mattingly Exhibits 3001, 3002, and 3004, I
12 would move their introduction, as well as Chen Exhibits 2010,
13 2011, 2012, I believe.

14 JUDGE OSTEEEN: All right. If they haven't been, they
15 are admitted.

16 MS. EARLS: So we are now at the point where the
17 Plaintiffs do not have any further witnesses to call, but there
18 are a few additional objections to work out with regard to
19 exhibits between -- amongst the parties so that we can then
20 provide to the Court an exhibit list that resolves -- either
21 maintains or abandons the final objections that have not
22 already been resolved.

23 It's my understanding that the Defendants' next
24 witness can't be available until tomorrow morning, so what we
25 would request is that the Court allow the parties the rest of

1 today to resolve these remaining issues with regard to
2 Plaintiffs' exhibits.

3 MR. STRACH: And we would respectfully request, Your
4 Honor, given when the witness is going to be able to get in, if
5 we could -- we request that we start at 10 a.m. tomorrow, if
6 that's okay.

7 JUDGE OSTEEEN: Judge Britt's the time manager.

8 JUDGE BRITT: Well, it depends on how many witnesses
9 you've got.

10 MR. STRACH: We're only going to have one witness
11 tomorrow and then, as I mentioned earlier in the week, we've
12 got -- our next witness can't be here until Thursday morning,
13 so it will be just one witness.

14 JUDGE OSTEEEN: So the possibility of some rebuttal
15 evidence?

16 MS. EARLS: That's correct, Your Honor, not
17 extensive, but we may depending on how the other testimony
18 comes in. We may want a limited opportunity to call one
19 rebuttal witness.

20 JUDGE OSTEEEN: All right. So it seems like I heard a
21 comment during the examination today about something wasn't
22 reviewed yesterday in great detail and I might take issue with
23 that statement. We've heard a lot of evidence. So be aware of
24 the fact we have been listening, we have been paying attention.
25 We don't need to repeat what's already been presented to some

1 degree. Now, you get some latitude to kind of reestablish the
2 connection between what was presented and what is going to be
3 presented.

4 So at this point you anticipate one witness tomorrow,
5 start at 10:00. Probably a two- or three-hour witness you
6 think, expert?

7 MR. STRACH: On my side, two hours at the most I
8 would think.

9 JUDGE OSTEEEN: And same for cross?

10 MS. EARLS: Probably not quite that much.

11 JUDGE OSTEEEN: Okay. So about four hours of
12 testimony tomorrow 10:00 -- starting at 10:00 and then -- is
13 tomorrow starting at 10:00?

14 MR. STRACH: Tomorrow, Wednesday, starting at 10:00,
15 yes.

16 JUDGE OSTEEEN: And then Thursday morning we'll have
17 one more witness, in the two-hour range, you think?

18 MR. STRACH: Yeah, 2, 2 1/2 max.

19 JUDGE OSTEEEN: We'll start --

20 MR. STRACH: 9:00 would be fine with us on Thursday,
21 Your Honor.

22 JUDGE OSTEEEN: I was just debating 8:30. Assuming,
23 as best you can, or guessing that you have to recall a
24 rebuttal witness -- I think it was Dr. Jackman you reserved the
25 right --

1 MS. EARLS: That's correct, Your Honor.

2 JUDGE OSTEEEN: Assuming you recall Dr. Jackman, what
3 are you talking about timewise?

4 MS. EARLS: Again, I'm saying a limited opportunity,
5 20 or 30 minutes.

6 JUDGE OSTEEEN: So 2 1/2 hours on Thursday morning, a
7 couple hours of cross-examination Thursday morning, and then
8 maybe an hour of Dr. Jackman possibly as rebuttal. So that
9 gives us four hours tomorrow starting at 10:00.

10 I've been kind of assuming that hopefully all the
11 dominoes would fall in place in terms of the stipulations, but
12 I think if you run into an issue and you feel like you're going
13 to have to put a witness on because the stipulation doesn't
14 work out -- Judge Britt may be getting ready to tell me no -- I
15 think tomorrow after this -- after you call your witness, if
16 that happens, then whoever needs to put evidence in needs to be
17 ready to go at that particular point and we can leave that time
18 for any cleanup. Hopefully it won't be necessary, but if it
19 is -- then Thursday morning we'll start at 9:00.

20 Is 8:30 a possibility with you guys?

21 JUDGE BRITT: Oh, yes.

22 JUDGE OSTEEEN: Be prepared. We may bring you in at
23 8:30 if you can get your witness in. We'll get started then so
24 we can try to clean up all the evidence.

25 Let me see what Judge Britt is talking to me about.

1 (Discussion between judges.)

2 JUDGE OSTEEEN: Okay. So one thing to think about.
3 This is -- don't do this. There are good reasons for it and
4 against it, so please -- I'm going to leave this entirely with
5 the Plaintiff.

6 But if Jackman's rebuttal testimony is going to
7 relate to what this witness says tomorrow and/or the Thursday
8 witness, if we have some time tomorrow, then you can consider,
9 if you want to, calling Jackman and dealing with whatever
10 rebuttal would come in response to tomorrow's expert. Then we
11 maybe save some time on Thursday. But if Jackman is better --
12 I'm leaving it entirely up to you. If Jackman is going to be
13 relatively short and a little bit of rebuttal to both experts,
14 then call him Thursday like you plan.

15 Everybody just keep in mind that the longer we're
16 taking evidence on Thursday, the clock will be ticking on what
17 time you can spend in terms of final arguments.

18 So it's a possibility -- first of all, tomorrow we'll
19 hear your testimony with whatever time's left. If there are
20 any witnesses and there are difficulties on stipulating and you
21 want to stick in some testimony very quickly, you can do that.
22 Then if you want to, entirely up to you, you can do a little
23 bit with Jackman tomorrow if that's the rebuttal testimony, but
24 you can hold Jackman to Thursday. I understand. Rebuttal
25 usually comes in at the very end of the case, so we understand

1 that.

2 Any questions about what I've outlined?

3 MR. STRACH: Not here, Your Honor.

4 MS. EARLS: No. Thank you, Your Honor.

5 JUDGE OSTEEEN: All right. Thank you all.

6 Anything else from you?

7 JUDGE BRITT: Sayonara.

8 JUDGE OSTEEEN: I didn't know what he was going to say
9 to me.

10 All right. We'll stand in recess until tomorrow
11 morning at 8:30. Hold on just a second. Excuse me. 10 a.m.
12 tomorrow morning.

13 (At 3:56 p.m., proceedings adjourned.)

14 * * * * *

15 C E R T I F I C A T E

16 I certify that the foregoing is a correct transcript
17 from the proceedings in the above-entitled matter.

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19 Date: 10/23/2017

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